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ORIGINAL CONTRIBUTIONS

THE TREATMENT OF PELVIC INFLAMMATION.*

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NON-OPERATIVE.

In this class should be included (1) all cases of acute infections of less than two months' duration, except those in which there is rapid pus formation with rupture into the peritoneal cavity, and a rapidly spreading peritonitis, or in which there is a palpable local abscess. (2) All cases of longer duration in which the symptoms and general condition of the patient show continued improvement to the extent of complete or almost complete relief in a reasonable length of time. It is especially desirable to avoid mutilating operations on women under 30.

In the acute cases, rest is the first requisite to success in curing the patient without operation. These patients should be given the same attention in trying to prevent the necessity for the removal of important organs as they are given after operation. In the severer cases, if treated at home, the woman should be put to bed with a nurse in attendance and kept there for from four to eight weeks, or until her symptoms are all gone. She should not be allowed to get out of bed for the urine or stools, but should use a bed pan. *Rest* should be further facilitated by the use of opium in some form in sufficient quantity, but with due regard for the danger of forming the habit. If this perfect control cannot be carried out at home, the patient should be sent to a hospital.

There are other measures of value, but of far less importance than is rest. Hot douches, which should be given three or four times a day, of sterile water or normal salt solution, of at least one gallon in quantity and from a low elevation, making the stream run slowly. If given in this way, the water is kept in contact with the tissues a longer time than if run through rapidly and will add greatly to the patient's comfort if it does no other good. Hot applications above the pubes will often also prove comforting. The much-abused glycerine and icthyo tampon sometimes seems to help, but should not be used until after the most acute symptoms have subsided, and never when there is an acute vaginitis. Cleanliness and gentleness are the chief points in technique, taking for granted that the tampon is placed well up in the fornices.

The diet should at first be liquid, and later light but liberal and nourishing. The bowels should be kept lax by salines.

After convalescence is established, the absorption of exudates may be aided by the use of some one of the iodine preparations—syrup of iodine of iron, syrup of hydriodic acid, or in plethoric patients, iodide of potassium, tonics as indicated.

Abstinence from the sexual relations should be enforced for several months after all sypmtoms have disappeared, and the woman should be instructed to rest in bed during the first two or three days of each menstruation for at least four months.

There is nothing especially original in this

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outline of a plan of treatment, but I wish to lay stress upon the importance of good nursing and of not only instructing your patient to stay in bed, but in seeing that she does it just as you would after having done a laparotomy.

If this is done many tubes and ovaries will be saved that would otherwise have to be sacrificed. I have on record several cases of both gonorrheal and puerperal pelvic infection with palpable masses about the uterus, that recovered without operation and have remained well, some of them as long as five years, and some have borne children without complications during or following labor.

OPERATIVE TREATMENT.

There are a few cases, usually following abortion, in which there is no localizing of the infection in the pelvis, and in which a rapidly spreading peritonitis develops. In such patients the abdomen should be opened, drainage established, and the Fowler position with the Murphy drop method instituted.

Large pelvic abscesses which adhere to the vagina should be opened at the most accessible point, usually the posterior cul de sac. Absolutely no other pelvic accumulation should be incised through the vagina. In any case in which palliative treatment has been faithfully carried out as outlined above, and the patient still suffers enough to seriously impair her health, an abdominal section should be done and all structures which are diseased to such an extent that they cannot be restored to function, should be removed, adhesions broken up, and raw surfaces covered with peritoneum. In this connection I will say that where the disease is purely inflammatory, the uterus may usually be left. It stands suturing well even where there is active infection. In December, 1907, I dissected out a large abscess of the right broad ligament, twelve weeks after labor, in a woman 19 years old. The mass was high up, not adherent to the vagina, and included the right tube and ovary with almost the entire thickness of the right uterine wall from the fundus to the attachment of the vagina to the uterus. The dissection took the tube and ovary with most of the broad ligament, and right wall of the uterus. The uterine wall was sutured from the junction of the vagina to the fundus with a running cat gut suture. The patient had a stormy time, but recovered. Smears showed strepto cocci gonococc and colon bacilli.

In February, 1908, fifteen months after operation, she was delivered of another fine baby by a very short normal labor. The uterus is now in good position and everything in the pelvis is apparently normal. She is also pregnant again. This is a case in which the removal of the uterus was apparently justifiable, if not actually necessary, and in which there seems to have been good union after suture of an extensive injury to the uterine wall with much actual loss of uterine tissue.

In the old chronic cases there is often a disproportion between the gross lesions and the pain caused by them. A little old hard fibrous tube or ovary with few adhesions will often make a woman a complete wreck, but it is gratifying to find that quick relief and permanent cure are usually effected by the removal of the diseased tubes and ovaries, and we can ease our consciences, if necessary, by reflecting upon the fact that the woman was already sterile in addition to being an invalid.

The appendix is usually diseased in these cases of chronic pelvic inflammation and should always be removed.

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DIAGNOSIS, PATHOLOGY AND ETIOLOGY OF PELLAGRA*

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In this paper I shall take up the subjects in order and discuss each separately. I shall first consider the question of diagnosis.

DIAGNOSIS.

The diagnosis of a well-marked case of pellagra, if one knows the characteristic signs and symptoms, is not a difficult matter. A triad of symptoms, that is, lesions on the skin, the gastro-intestinal disturbance and the nervous manifestations, must always be kept in mind. As a rule, in the majority of cases, the diagnosis has not been made until the skin lesions have developed, although the nervous and gastro-intestinal might have been in existence for some time. The cause of the disease, whether it be toxine or micro-organism, seems to expend its energies first upon the gastro-intestinal tract, and finally all the tissues of the body are affected. The nervous structures are so deeply affected as to present the nervous phenomena observed, such as the loss of the expression of intelligence, the exaggerated knee jerk, the tremor, the ataxic gait, anesthesia of the areas of eruption, and melancholia. The gastro-intestinal and nervous symptoms are the first, no doubt, to exist and would always be the first to be seen if they were only sufficiently manifest. But there is an idiosyncracy to the sun existing in the skin of a patient infected with pellagra and because the majority of patients are exposed to the sun the first most marked and manifest symptoms are those of the skin in the majority of cases. We shall now take up and describe the skin manifestations of the disease, since they are the most important in the point of diagnosis, although the other symptoms may precede them. We have been lead to believe in this country that the skin lesions appear only during the hot months of the year, beginning in the spring and closing in the fall, but we have found that to be a mistake, for we have had cases here in Nashville to develop the skin lesions during the winter while confined to bed from the gastro-intestinal disturbance. We cannot say that the skin lesions are always due to the influence of strong sunlight. However, it is true that the majority of cases do not show any skin lesions until the patient has been exposed to strong sunlight. We can best illustrate the subject in this way: If a patient who has become infected with whatever causes pellagra is exposed to direct sunlight the skin turns red on the exposed parts and appears very much like an ordinary severe sunburn, and on account of this the disease has been called by many different names, such as "Mal de la Rosa" and "Mal de Sole," conveying the idea that the disease is one of the sun. This erythema or redness most often appears on the exposed surfaces, as the face and neck, and shoulders, the dorsa of the hands and feet. Sometimes the redness is more like a purpuric lesion than that of a simple erythema, and the color ranges from that of a dark dusky red to a livid red. The lines of redness are well marked. If it is on the face, it appears as if a mask has been placed over the features with a distinct line of demarkation. When on the hands the redness may be in patches or may cover the back of the hand and up the wrist to about where the sleeve usually strikes the wrist, presenting the appearance of a glove-like redness. If on the feet, it forms distinct patches or it may extend to the ankles, or even higher up to the knees with rather distinct lines of demarkation. In some cases there is slight swelling. In other cases the inflammatory process may go further than that of producing only an erythema and even blisters of larze size—the size of a plum or egg—may develop. In two white cases which I saw develop during the winter, the redness on the

*Read before the Joint Meeting of the City and County Heatlh Officers in conjunction with the State Board of Health, State Capitol, April 6 and 7, 1910.

backs of the hands was not very extensive. It covered only the area over the meta-carpo-phalangeal joints. It simply formed a band across the back of the hand. There was no lesion on the feet or face, but there was some redness on the extensor surfaces of the forearm. The redness developed in these two cases while in doors and in bed. The areas of redness are anesthetic. The erythema in the early cases fades under treatment, or when the cooler weather sets in. The affected surface then becomes dry, rough and scaly and sometimes cracks are formed. Finally the skin may become soft and normal in appearance. With return of spring or summer there is usually an exacerbation of the skin lesions. This dry rough condition of the skin gave the disease the name of pellagra, meaning a rough skin.

The question now arises as to what these skin lesions might be mistaken for. One might possibly think of such lesions being mistaken for erythema multiforme, because it develops on the same areas, but the lesions of this eruption are of brighter red color, are more acute in their development, and there is more edema in the different lesions and there is no anesthesia on the red areas.

Lichen planus sometimes develops only on the backs of the hands, but the lesions of lichen planus are so characteristic that I can scarcely see how an error could be made. It is rare indeed for a lesion of syphilis to appear like those of pellagra. Erythema multiforme is probably the only disease in the early cases of pellagra that would lead to any difficulty. As a matter of course, if the gastro-intestinal symptoms are marked and the case is well advanced, there would be no difficulty in differentiating erythema multiforme on account of the marked constitutional disturbances found in a well advanced case of pellagra.

In the early cases of pellagra if the skin lesions are the first signs of the disease and are mild in character, the patient will appear otherwise perfectly well. It is possible for some cases of eczema to bear a resemblance to the lesions of pellagra, but eczema nearly always is characterized by a marked itching, while there is scarcely any itching associated with pellagra on account of the areas being anesthetic.

So, if one keeps in mind the areas covered by this pellagrous eruption, the color of the eruption, the extent of it and the anesthesia associated with it, and the well marked cases of constitutional disturbances associated with it, he can scarcely make a mistake.

While the diagnosis of pellagra usually depends upon the manifestations of the skin lesions, it is well to be on the lookout for gastro-intestinal disturbances and the nervous symptoms. In the course of the disease the gastro-intestinal disturbances are usually the ones to develop after the skin lesions have formed. As stated above, if the case develops during the winter or early fall, the gastro-intestinal disturbances may be the only marked symptoms of the disease, the skin showing up only a short time before death. It is necessary then, to define the gastro-intestinal disturbance and other symptoms that might be observed.

Beginning with a troublesome diarrhœa, a severe stomatitis develops, the whole mucous surface of the mouth turns a dark dusky red, blisters may form on the mucous membrane, ulcers may develop on and under the tongue and the mouth become so tender and sore that the patient can scarcely open it to show the tongue. The mouth looks as if it had been severely scalded, and the patient cannot masticate any food. Associated with this there is a gastritis with a great deal of vomiting, making it necessary to feed the patient by the rectum, which is also inflamed to such an extent that it scarcely retains the food. The diarrhœa seems to be a result of a complete gastro-entero-colitis. The diarrhœa is practically uncontrollable, there being as many as twenty to sixty movements from the bowels daily, even a drink of water causing an immediate evacuation of the bowels. In one case observed during the winter a hemorrhage from the

uterus and vagina, associated with a sore mouth, were the first symptoms of pellagra to appear. The diarrhœa came on later, and still later the skin lesions appeared. These severe conditions may exist for a week or two and then gradually improve until the patient is apparently well, or again may lead to an early death. In the bad cases, there is a recurrence, from time to time, of the gastro-intestinal disturbances growing in severity with each recurrence, finally ending in death. During these attacks there is very little rise of temperature. The pulse may be very rapid and weak.

NERVOUS SYMPTOMS.

By the time the disease has developed to a well marked case the nervous symptoms may be observed. There is an increasing sensation of languor and general malaise. There is a lack of expression in the features; there is a fixed countenance. All the cheer and good nature of the patient is gone. There is no smile or pleasant look about the face; the knee jerk is nearly always increased; vertigo is frequently observed; ataxia and tremor sometimes develop. In the later stages of the disease, melancholia may ensue.

With these three groups of symptoms well in mind, the physician will have little difficulty in making a diagnosis of the case.

PATHOLOGY.

We shall next discuss the pathology of the disease.

Litterer describes the autopsy findings in a male twelve years of age as follows:

"Extreme emaciation and absence of adipose tissue. The external lesions had markedly improved from several months ago.

"The lungs, hypostatic, heart, flabby and small, valves normal. Liver, enlarged slightly. Spleen, three times larger than normal, and very dark and friable. Kidneys were slightly congested, normal in size and capsule stripped easily. The stomach was enlarged and very thin. In places it appeared as if it had no mucous membrane. No blood found in stomach. In the jejum, ileum, colon, there was a marked thinning of the mucous membrane. Blood was found in the entire intestines. In a few areas the wall of the intestine was so thin that it gave the appearance of an erosion.

In opening the spinal cord I was struck with the fragility of the bones. The spinal cord showed an inflammation and thickening of the dura mater.

MICROSCOPICAL.

(1) Lungs are hypostatic, congested.

(2) Heart muscle undergoing fatty degeneration in areas, while in others an atrophic change has taken place.

(3) Liver shows it to be cloudy swelling, fatty; also there is an excessive pigmentation of the cells of the liver.

(4) Spleen shows a marked hyperplasia and cloudy swelling with some pigmentation of cells.

(5) Stomach and intestines show a marked thinning of the mucous membrane with congestion in areas.

(6) In the spinal cord is found a degeneration of the posterior column differing from that of tabes in showing no involvement of the posterior roots. There is also found in this case a degeneration of the cells in Clark's column; also changes in the large Betz cells of the ant. horn.

Cultures were made from heart blood, liver and spleen with negative results.

The Wasserman reaction was positive.

Tuczek (2) describes the wasting of adipose and muscular tissues, brittleness of the bones, atrophy and fatty degenerations of the internal organs, heart, kidneys, spleen, intestines, liver and lungs. He also describes three other groups of morbid changes; first, intestinal atrophy of muscular coat with occasional hyperemia and ulceration of the lower part of the tract; second, abnormal pigmentation, especially of ganglionic cells, heart muscalature, hepatic cells, and spleen; third, alterations in the nervous system. In the cord the changes are fairly substantial and important; degeneration in the lateral columns in the dorsal region and in the posterior columns in the cervical

and dorsal regions; very few changes are found in the lumbar cord. The findings in the brain are in most cases negative. He also states that typhoid pellagra has no special pathology.

Lombroso (2) from observations on 113 necropsies, describes changes very similar to the above.

Radcliffe-Crocker (1) has described the skin changes as consisting of, first, congestion, second, thickening and pigmentation, and third, atrophic thinning.

ETIOLOGY.

In discussing the etiology of pellagra it should be stated in the beginning that the ultimate cause of the disease is still unknown. Since the disease was first observed by Casal in Spain in 1735, investigators have endeavored to determine the cause. During this period so much research has been done and so many different causes have been brought forward that it would be unwise to discuss all of the experiments and the results at this time. A detailed discussion would only lead to a confused notion of the question as to etiology and at the end leave us with no definite conclusion except to show the chaotic situation with reference to the cause of this disease. I think we are safe in making the statement that pellagra is a distinct disease with morbid phenomena peculiar to itself, and I think we are safe in making the statement that it is due to some specific cause, whether to toxic substances, to a fungus or to protozoan bodies. I make these statements here because it was thought by some of the early writers to be a *morbus miseriae*, or a symptom complex of some condition other than pellagra.

For one reason or another, from the earliest times in this disease, corn or maize has been held responsible for the disease, or has been associated with the cause. In recent years, some authorities have come forward with another idea, with the statement that corn has nothing to do with pellagra, so in presenting the question of ethiology the two phases of the subject must be discussed, and I shall present them as briefly as possible. Those who favor the corn theory are known as "zeists" and those who oppose that theory are known as "anti-zeists."

The disease was first observed in Spain in 1735, and later on was found to exist in Italy, and there it was that corn was first associated with pellagra. In 1826 a fungus, found growing on corn, which was thought to change the oils of "zein" of corn into a toxic product, was believed to be the cause of pellagra. Later on, in 1845, it was thought that a living organism, a mold, was responsible for the disease. Again, in 1860, a smut on the grain was held responsible for the disease. In 1871 Lombroso, who has been one of the closest observers and most extensive investigators, announced that pellagra was an intoxication, not an infection, caused by the ingestion of certain toxic substances which are elaborated in damaged maize by some form of micro-organism living upon it. His experiments satisfactorily demonstrated this opinion to himself, and it is the most popular and current theory at the present time, and is known as the "verdet" theory among the zeists.

The association of corn with this disease has grown out of the fact that the Italian peasants where pellagra is prevalent have used corn meal cooked into a form of mush called "polenta" as their chief article of food. The mush is made, allowed to stand for many days, eaten cold, and served as a food until it is consumed and then another supply is prepared. Among the inhabitants where this is practiced pellagra was found to be more prevalent. It is well to state here that in other sections of Italy where the peasants ate the polenta hot, pellagra was not prevalent. So, it is believed by the zeists that corn in some way is responsible for this disease—first, it may bear the micro-organisms which cause the disease; second, a micro-organism living upon the corn may produce such changes in the material of the grain that pellagra will result from the ingestions of the toxines thus produced.

We shall next discuss the anti-zeists' theory.

In 1905 Sambon presented the idea that pellagra was due to a protozoan, and this opinion is endorsed by no less an authority than Sir Patrick Manson. The anti-ziests present many novel arguments to sustain their theory. They state that corn was used two hundred years prior to the appearance of pellagra. They state that they have observed many pellagrous patients who have never used corn as an article of diet. In the province of Badajoz, in Spain, where corn meal is not used, cases having all the symptoms of pellagra have been noted. Hyde states that it is certain that those who have never consumed corn have had pellagra.

In considering the two theories, it seems to me that the preponderance of evidence is in favor of the ziests. I shall take time to cite a few instances. In Mantua, where polenta is eaten moldy and cold, pellagra is frequent, but in Umbria, where the polenta is eaten warm, pellagra is scarce. In countries where pellagra is prevalent to a certain extent there are spots where the inhabitants live largely upon fish, and pellagra is not found. Other spots have been found where the inhabitants of a village would eat no corn, but would susbsist largely upon wheat bread, and there would be no pellagra. In Ireland and in Burgundy corn is extensively used as a food but in both of these countries the grain is dried in ovens as soon as harvested. The introduction of pellagra into the island of Corfu did not occur until the inhabitants stopped growing their own corn and began to subsist upon spoiled imported corn from Roumania. In our own country we have not been yet able to locate a case of pellagra that has not taken corn as an article of diet. With reference to the two theories we must still have an open mind, and the decision reached by the National Pellagra Conference, held in Columbia, S. C., in 1909, is a fair one. It states that "while corn is in no way connected with pellagra, evidences of the relation between the use of spoiled corn and the prevalence of pellagra seem so apparent that we advise continued and systematic study of the subject, and, in the meantime, we recommend to corn growers the great importance of fully maturing corn in the stalk before cutting the same."

With reference to the class of patients afflicted with this disease it may be stated that practically no age is exempt, but it is most frequently found between 20 and 40. Here at Nashville a group of children became afflicted with the disease, their ages ranging from 3 to 12 years. The well-to-do are as liable to infection as the poorer classes. The males are affected as often as the females.

It seems from observations that have been made that when the disease becomes established in a locality it is permanent. Apparently it is impossible to eradicate it from Italy, Roumania, Austria and now, our own country. The Italian Government has spent, and is spending, large sums of money in teaching the people how to prepare their foods and furnishing them sound corn and good bread, yet it seems difficult to make appreciable progress in the eradication of the disease. When we think of what an easy matter it is to sterilize food products, and when this is done in sections where pellagra is prevalent, and the disease continues to spread, it forces us to think that there is some other cause of infection than through articles of diet. In our observations here at Nashville there are three groups of patients in which it seems possible that there might have been some other means of transmission of the disease than through food. The first group was that of seventeen children at the Baptist Orphanage. This group seemed to grow from one patient, a girl three years old, who died during the second year of the disease. The second group was a case where a woman did the laundry for a male patient who was suffering from pellagra, and in the course of a few months developed the disease and is now in a critical condition. The third group is the case of a wife developing the disease and her husband soon afterwards presenting unmistakable signs of pellagra. In these three groups it is possible that the patients of

each group may have separately partaken of something which conveyed to them pellagra. The children at different times, it is possible, could have partaken of spoiled corn meal or some other article of diet and thus become infected, and in this way show no relation to the primary case, but there is something rather remarkable to relate with reference to this group of children. Among the group there were four of one family, all of whom have developed pellagra with two deaths, the only deaths in the entire group. The older children waited upon and were associatel with the youngest child in her last sickness, and these children were associated with all the children in the institution—the Baptist Orphanage. When we consider these three groups it certainly causes us to wonder if there is possibly any means by which the disease may be communicated from one to another, but this question is a question we cannot decide here.

Considering the disease as we have observed it here, it presents itself to me as one due to a specific infection, and that I believe to be a micro-organism. It is rather anomolous to explain how a toxine could exist in the body and bring about the exacerbations which are observed in pellagra. We cannot understand how a toxine, a chemical product, could exist in the body inactive, as it were, during certain periods of the year, and then become very active at other periods and continue to grow in intensity from year to year until the individual succumbs to its ravages. Tuberculosis is usually a slowly progressive disease. As a rule syphilis is a progressive disease, attacking all the organs of the body. Leprosy is a slowly progressive disease. I mention these because we are familiar with them. Pellagra is usually a slowly progressive disease, but sometimes rapid, just as tuberculosis and syphilis may be unusually rapid.

Then, finally, when we may consider the clinical manifestations of this disease, that is the skin lesions, the nervous phenomena, the gastro-intestinal disturbances, the pathology associated with them, and the fatality of the disease, it seems that we can think of but one cause, and that is some specific infection, and that infection may be or may not be transmitted through corn.

1. Pellagra a Precis, Lavinder.
2. The Etiologic Controversy Regarding Pellagra, A. M. A. Jour., March 12, 1910.

133 *Eighth Avenue, North.*

A DISCUSSION OF GASTROGENIC DIARRHEA

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The term diarrhea is usually applied to the too frequent discharge of more or less fluid stools, and may vary within wide limits. The personal equation must be considered, for, while the majority of individuals secure one daily movement of semi-solid consistence, some consider themselves normal with two or three in twenty-four hours, and a very few evacuate the bowels only once in two or three days, seeming to suffer from it neither inconvenience nor impairment of health.

When, however, the peristalsis normal to the individual is hastened, when the stools become too frequent and too watery, and when relief is not obtained after the intestinal tract is thoroughly emptied, it is necessary to find the location giving rise to this abnormal condition.

As Dr. Blackader, of Montreal, reminds us, we are dealing with a canal which is lined with various forms of glandular epithelium, and which has to perform functions of digestion, absorption and elimination, while it is in direct communication with external agen-

cies, some harmless, some beneficial, some dangerous. These functions being mutually complementary, a disorder in one promptly leads to disturbance in the others.

The etiological factors concerned in the many forms of loose bowel movements will not be specifically considered here, except as they relate to disturbances of the stomach functions, and this diarrheal expression of faulty gastric digestion may be denominated *gastrogenic diarrhea,* or, as characterized by Einhorn and Oppler, diarrhea gastrica.

The fact that digestion of food-stuffs can proceed satisfactorily in the case of patients with increased or diminished, or even lost secretion of the gastric glands, and the fact that, under such conditions the bile, pancreatic juice, and succus entericus seem to take on an increased compensatory activity, permitting metabolism to continue almost normally, has caused many otherwise careful investigators to minimize the importance of gastric delinquencies upon an accelerated fecal current.

An acute lientery due to gastronomic excesses requires neither diagnostic acumen nor therapeutic skill in its recognition and management, and need not be dwelt upon here.

There are, however, frequently coming under observation cases of chronic diarrhea, where all disturbing factors incident to the small and large intestine, including the auxiliary organs, have been thoroughly investigated, where hygienic, dietetic and medicinal measures have been intelligently invoked, but the loose bowel movements are not abated.

As in a number of instances of civic and corporate unrighteousness recently brought to light, the chief aim of those concerned in the correction of the abuses was to get at "the man higher up," so we, in our efforts to readjust a disquiet peristalsis, should likewise get at "the *organ* higher up," for in so doing often the key to the whole situation will be revealed.

Hemmeter uses these words in an article just published: "Whenever there is chronic diarrhea, it is absolutely necessary to examine the stomach contents, even if the patients have no stomach symptoms (1).

Blackader stated recently: "More important, however, as an etiological factor in the production of loose movements, is a faulty performance or gastric functions. Both defective secretion and defective motility favor fermentation in the gastric contents, and lead to the development of irritating organic acids and gases, and also to a great increase of bacterial growth. Hypersecretion with marked hyperacidity of the gastric contents may, by the discharge of extremely acid chyme into the duodenum, neutralize the normal alkalinity of the contents of the small intestine, and by so doing inhibit the action of the pancreatic enzymes, irritate the intestinal mucosa, and interfere with absorption" (2).

In establishing the diagnosis of gastrogenic diarrhea, the first point to note is the history of present or past stomach symptoms.

Unless in an indirect manner, a hyperacid stomach will not cause diarrhea—on the contrary, constipation is usually present. My records for the past two years disclose only one instance of a chronic diarrhea, that could be fairly ascribed to a hyperchlorhydria.

In achylia gastrica diarrhea is extremely common. Stockton noted 31 patients complaining of chronic diarhea out of 115 (3), and Woehnert, in analyzing the histories of 16 cases, found diarrhea in the majority (4). Von Tabora observed typical diarrhea in 20 per cent of his cases (5), while my own records approximate 30 per cent of diarrheal histories where there was found either absence or marked diminution of gastric juice.

Subjectively Kincaid remarks that this diarrhea is rather different from that due to primary intestinal disturbance, in that it occurs without straining and usually without pain, though there may be colicky pains, varying in severity with the size and character of the meal. Occasionally the bowels move several times in succession early in the morning, the stools being large and containing visible

particles of undigested food. Also the desire to evacuate the bowels soon after a hearty meal is of frequent occurrence, the reason being apparent (6).

It has also been proved that in hypoacid conditions overgastric motility is the rule, and that the extra activity beginning in the stomach starts a wave which rapidly continues to the colon. This I have observed more often after breakfast.

Another fruitful source of gastrogenic diarrhea is found when, unchecked by the antiseptic power of free acid, the intestines are flooded by specific microbes from the stomach, completely overwhelming their normal flora. There is then set up, according to the composition of the nutritive soil, either an "intestinal putrefying dyspepsia," spoken of by Von Tabora, or, more often, an "intestinal fermentative dyspepsia" as described by Schmidt and Strasburger (7).

Long continued gastric achylia may be followed by pancreatic achylia, producing "secondary insufficiency of the digestion of the small intestine," as denominated by Schutz. Under such conditions we find in the feces yeast, sarcinae, long bacilli, or flagellates, originated in the stomach, and propagated in the intestines.

The most important information concerning the etiology of practically every form of chronic diarrhea is obtained by a painstaking examination of the stools after the Schmidt-Strasburger test diet, and, while it demands some care and attention to detail, the data gained is nearly always amply worth the trouble entailed.

This test diet in its simplest method consists of the following: Morning, coffee, tea or cocoa with much milk, oatmeal with milk, a soft-boiled egg, a roll with much butter. Noon, bouillon, if desired, four ounces of lean minced beef roasted in butter, half raw inside, a whole plate of fine mashed potatoes, tea with milk, a roll with butter. Evening, oatmeal with plenty of milk, one or two eggs cooked in any desired way, or roast veal if preferred, a roll with butter, and tea with milk.

This should be kept up for about three days, and the stool then examined microscopically. The presence of undigested connective tissue, especially if there is much of it, is nearly always sufficient to name the stomach as the culprit.

Schmidt and Aaron claim, and I believe correctly, that of all the digestive secretion, the stomach juice alone can digest raw connective tissue (8).

Very occasionally there is a hypoacid stomach that seems capable of digesting this tissue, and on the other hand there are hyperacid ones that seem inadequate to the task, but such rare exceptions need not militate against the value of this test, for in such instances there will be other indications pointing to a defective gastric performance.

Another test for the activity of stomach digestion is the desmoid-test of Sahli. This test consists of tying a small rubber bag filled with methylene-blue with a thread of catgut. This bag is swallowed with the noon meal, and if within twenty hours the urine turns blue, the stomach is doing fair work, for catgut is another substance only amenable to solution in the stomach, he believes.

This test I have not used enough to report on intelligently, but where other tests do not work out satisfactorily, it is worth a trial.

Having become satisfied that a chronic diarrhœa is of a gastrogenic nature, the treatment naturally focuses on the stomach, though irritative states of the intestines, concomitant or secondary, must not be neglected.

In cases of achylia gastrica or hypoacidity, HCL is the sheet anchor in the treatment, and may be given alone or with pepsin. While we cannot hope to supply enough of either of these agents to carry on normal digestion, we usually get prompt and satisfactory results, not only on gastric but also intestinal digestion. In a few days the connective tissue disappears from the stools along with a marked amelioration of the diarrhea.

I have noted, as well as others, an occasional achylic stomach that seemed intolerant of HCL, and this idiosyncrasy must be respected when met.

In addition nux vomica, condurango, or orexin before meals will often wake up a sluggish gastric mucosa, and be followed by a satisfactory secretion.

When the pylorus is relaxed and patulous, permitting a too quick emptying of the stomach, as well as the escape of unprepared food into the duodenum, intragastric faradism with external vibratory massage is frequently of decided benefit.

Dietetic regulation is, of course, highly important. Meats should be soft, tender, well cooked and well divided, and as free as possible from connective tissue. Foods containing an excess of cellulose should be avoided, and the well cooked or mashed vegetables and fruits allowed. Especially well borne are the vegetable purees, as those of peas and beans.

Should the teeth be bad, they should be put in order, as thorough mastication is a *sine qua non* in the management of these conditions.

Artificially soured milk, or lacteal champagne, generally agrees better than sweet milk, not being so prone to set up flatulence. The latter, when used, is best peptonized.

Lavage of the stomach holds a valuable place in the treatment of chronic diarrhea, even in instances where the proof is not clear as to its gastric origin. We sometimes encounter cases, which, for want of a better term, are designated "chronic dyspeptic diarrheas," and where a lavage containing nitrate of silver or salicylic acid gives almost spectacular results.

If antiseptic treatment of the stomach is indicated, as in dilatation of the stomach—atonic type—with fermentation and motor insufficiency, or stenotic type, with fermentation, motor insufficiency and gastritis, boracic acid, sodium salicylate, thymol, creolin, lysol, or ichthyol, in average strength (about 1-1000) may be employed to advantage. When those medicated douches are used, however, it is well to use a mild saline solution first, then the medicated fluid, then conclude with plain water.

I might fitly add that in every chronic diarrhea, whether from intestinal irritation, from pathogenic bacteria or protozoa, from defects of intestinal absorption or secretion, or even from hurried peristalsis due to impulses received from the large nervous centers in the cord and cerebrum, intelligent investigation of the stomach activity, with proper hygienic and therapeutic measures directed to that much abused viscus, will in a vast majority of instances yield results entirely commensurate with the time and thought expended.

The Ewald-Boas test meal has come into its own, having won a fixed and honorable place in our diagnostic armamentarium. The proper examination of the stools is also coming into its own, and, under the stimulating teaching of Schmidt, Strasburger and others, the profession at large is appreciating the fact that in this we have a mine of information concerning the functioning, not alone of the intestines, but also "the organ higher up"—the stomach.

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TUBERCULIN TREATMENT IN PULMONARY TUBERCULOSIS*

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Soon after the announcement by Robt. Koch in 1882 of the discovery of the tubercle bacillus there quickly followed many attempts to destroy the bacillus in the tissues of the infected organism by the administration of various substances found to kill it in vitro. All such attempts were, of course, futile, especially since many of the substances that were recommended which if used in sufficient strength would have killed the host as quickly as the parasite. The literature during that period abounded in wonderful cures and marvelous results obtained by some, from the use of these so-called "false specifics," only to be followed by others, by deep disappointment and ultimate abandonment of the remedies. Today, a sign of the times is the paucity of publications referring to fresh or new remedies aside from the specific treatment of tuberculosis by the various tuberculins. A perusal of current literature reveals an unmistakable increase in the actual practice of the specific treatment of tuberculosis and also palpable progress in the growth of our knowledge of the main lines along which it should be conducted.

When Koch in 1890, proclaimed his sensational discovery of a specific remedy against tuberculosis, perhaps there never was an announcement made in the realm of medical science that carried with it so much hope as did that of the discovery of tuberculin. Koch made two claims for tuberculin: first, that it causes a specific reaction in tuberculous individuals; and, second, that it has curative properties. For its administration he laid down the following very sensible rules, and if they had been followed the world would have been spared those dreadful scenes which resulted from its early trial: 1. Only patients that have little or no fever and in whom the process has not advanced too far, are suitable for treatment. 2. One begins with a very small dose and increases it so slowly that only very slight reactions or even none at all take place. 3. If reactions take place tuberculin must not be injected again until the temperature has been normal for one or several days. 4. The treatment with tuberculin must be repeated till, after an interval of three or four months, the capability of reaction is permanently extinct (Pottenger, p. 168). These rules, although formulated eighteen years ago, are even safe for today. Of course all these years of experience have taught us different methods of administration as well as its employment in selected advanced cases. Koch's rules were absolutely disregarded. Large doses of tuberculin were administered to all sorts of cases, and many a poor, far-advanced consumptive was hurried to his grave. A patient for instance was given tuberculin and reacted to 104 deg. F. on the following day, when he received a second dose with similar results. This was continued in many cases until death ensued. It was not long before the majority of physicians dropped the new remedy with as much avidity as they had taken it up. The age of "tuberculin terror" may be said to have begun at this time and he who used tuberculin was looked on by many as a criminal. In spite of the general disappointment which followed its misuse, in spite of the fact that much harm was done and death hastened in many instances, there were a few great and far-seeing minds who grasped the meaning of the remedy and realized that Koch had introduced a therapeutic agent which was destined to live. To a few German physicians, Goetsch, Spengler, Krause, Heron, etc., led by Koch, and to Trudeau, Von Ruck, Pottenger and others in this country have been instrumental in causing a reconsideration and new trial of this remedy.

*Read before the Upper Cumberland Medical Society at Cookville, Tenn., May 24 and 25, 1910.

Notwithstanding their consummate efforts in behalf of tuberculin this revulsion of feeling on the part of the profession lasted for some years, but about 1898 interest in the remedy was revived. Infinitesimal doses were given, and an attempt was made to render reactions of minimal occurrence instead of considering them the great desideratum. The present period could appropriately be called the "tuberculin renaissance era," which began a few years ago. Apathy has given way to enthusiasm. Again the scientific world is inflamed and the pendulum is swinging the other way. It is well for us to pause a bit lest this very enthusiasm lead us to discredit a method which, when used rationally and understandingly, is unquestionably a most valuable aid in the treatment of tuberculosis.

THE TUBERCULINS.

The term "tuberculin" is a broad one and has been applied to nearly all products made from the tubercle bacillus, but in reality belongs only to those which are made from the culture fluid on which bacilli have been grown. For the past six years I have been making my own tuberculins (according to the formulas given below), not only for therapeutic uses but for experimental purposes. In conducting the various experiments incident to the immunization of the lower animals, it is manifestly apparent that absolutely fresh products be obtained from bacilli of known virulence. These bacilli represent three separate and distinct types, viz.: Human, bovine and avian bacilli. For therapeutic purposes I have been in the habit of using one of five different types or strains of human bacilli which were isolated from various tuberculous subjects for the purpose of exchanging one strain for another in case the patient failed to respond to the treatment as rapidly as he should. I have deemed it wise and expedient in a number of instances to mix equally the five human strains or to use solely the tuberculin made from the bovine or avian bacillus. By such a procedure I have observed that after a change of this sort that patients (where they appeared not to be doing well) were again on the road to health even after the measures previously applied seemed to have reached the limit of their efficacy.

There are described between fifty and sixty varieties of tuberculin. Of these only a few will be considered while others being either modifications of these or having proved inefficacious.

The first used was Koch's original tuberculin, "O. T.," called also "Old" Tuberculin, to distinguish it from his more recent products, "New" Tuberculin. (1) The original tuberculin Koch (O. T.) is the concentrated germ free culture media (Glycerin bouillon), in which the tubercle bacilli were allowed to grow for several weeks. (2) Bouillon Filtrate "B. F." is the unheated, unconcentrated, filtered (through porcelain) bouillon culture of human tubercl ebacilli.) (3) "New Tuberculin," Tuberculin R., "T. R.," or "Tuberculin Residue." This is prepared by growing a virulent culture of tubercle bacilli. They are dried in the dark in vacuo and then pulverized. The powder thus obtained is suspended in distilled water and centrifugated at very high speed for about thirty minutes. The water (which is called tuberculin obere "T. O.") is then drawn off, discarded, and the bacterial residue is again dried in vacuo, as above, and treated in the same manner. This is done for several times. It is supplied in liquid form, containing 2 mg. of the powder to the C.C. of 20 per cent glycerin solution. (4) Bacillen Emulsion, "B. E." This is Koch's latest product, which he has suggested for active immunization. It consists of an emulsion of the ground-up tubercle bacilli in equal parts of glycerine and normal saline solution. (5) Bovine Tuberculin. Perlsucht Tuberculin (P. T. O., Spengler) is made from the bovine bacilli without subjecting the culture fluid to heat which is believed injures its activity. The bacilli are grown until they form a covering on the culture medium when they are removed by filtration and the filtrate concentrated by placing

it in an incubator until it equals one-half of its original volume. It is then restored to its original volume by the addition of glycerin.

Spengler and Pottenger find that preparations made from the bovine bacillus are much less toxic for human infections than those of the human bacillus and at the same time they find them more active in their stimulation of the machinery of immunization as is shown by their power to increase the specific agglutinins of the blood. There are many other preparations that are more or less well known, viz.: Antiphthsin (Klebs), the water extract of tubercle bacilli (Von Ruck), Hunter's modification of old tuberculin, Beranek's tuberculin, Von Behrings tulase and many others.

CHOICE OF TUBERCULIN.

Of the three forms of tuberculin mostly in use today are the Koch's New Tuberculin T. R., B. E. and the (B. F.) of Deny's, with bovine tuberculin rapidly gaining popularity. It would seem, theoretically that the B. E. would be able to produce the greatest amount of anti-bacterial immunity, while Deny's tuberculin "B. F." appears to be best suited for the production of an anti-toxic immunity. This tuberculin contains the products of the tubercle bacilli disintegrating during the growth of the culture, as well as the unchanged products of the tubercle bacillus given off in its growth. It is less toxic than the Koch's Old Tuberculin "O. T." and undoubtedly possesses immunizing properties which are destroyed in the "O. T.," as a result of the prolonged heating to which it is subjected. The Bacillen Emulsion does not represent the products of bacterial action such as are found in the "O. T." and "B. F." and therefore to my mind is one of the reasons why it should not be solely used in the treatment of tuberculosis. Again it is slow in its absorption and will cause many more general and local reactions as compared to the Bouillon filtrate "B. F." Up to two years ago I have used only the "B. E.," since that time equal parts of the "B. F." and "B. E." have been employed with apparently very much better results than with the "B. E." alone. I am strongly of the opinion that the ideal therapeutic agent for the treatment of tuberculosis is the combination of two products, viz.: Equal parts of the Bacillen Emulsion "B. E." and Deny's tuberculin "B. F." This mixture would combine whatever immunizing properties that exist in either the tubercle bacillus or the culture fluid.

ACTION OF TUBERCULIN.

Whenever a cure of tuberculosis takes place it consists in establishing upon the part of the infected individual an immunity to the tubercle bacillus and its toxins. All bacterial diseases depend for their recovery upon the favorable action of the machinery of immunization. A cure from diseases of bacterial origin may be considered synonymous with immunity. This immunity may be ever so transitory as is noted after pneumonia or somewhat more lasting as is observed following diphtheria, or it may be quite permanent as we find it after syphillis, smallpox, etc. When the body tissues are invaded by specific micro-organisms a struggle for mastery at once ensues. The anti-bodies which are normally found in the tissues destroy some of the invading bacteria, liberating endotoxins, etc., which in turn stimulate the body cells to the formation of more anti-bodies. In other words, any toxin which, when introduced into the organism, has the power of stimulating the system to the production of anti-bodies which are for that particular poison. The ultimate outcome of the battle between the bacteria and body cells of the individual depends upon the number or virulence of the bacteria on the one hand and upon the capability of the body cells to respond to the stimulation on the other. The anti-bodies found in an animal as a result of the recovery of an infectious disease are of several different toxins, precepitins, stimulins and coagulins, have thus far been studied and there may be still others as yet undiscovered.

It is manifestly important to know that these specific anti-bodies above noted can be

produced in many diseases by the inoculation of bacteria which have been killed at their minimum thermal death point. The anti-bodies that are formed as a result of injecting a certain type of bacteria are specific for that particular micro-organism. Thus typhoid bacilli cause typhoid anti-bodies; Staphylococci produce Staphylococci anti bodies and tubercle bacilli ("Bacillen Emulsion and products) manufacture anti-bodies for the tubercle bacillus. So the use of tuberculin is based on the principles of artificial protection, and it is our desire to obtain an over-production of anti-bodies in order to build a defensive armament against which the tubercle bacillus and its ravages will be impotent.

In tuberculin therapy we propose to produce an active immunization. To establish such an immunity it is absolutely imperative that the toxins (tuberculins) act with regularly progressive intensity on those groups of cells which produce toxin immunity. Stimulations of a slight or stationary nature are not sufficient to set in motion the machinery of immunization. It has been shown by Roux and Von Behring that properly spaced many small increasing stimulations are of greater import than one large stimulation. Likewise Trudeau affirms that infinitesimal doses of tuberculin, methodically increased, which produce only slight stimulation of the defensive resources of the organism, result in a well-marked toxin immunity, as shown by increased toleration to large doses of toxin, while large doses or too rapid an increase may bring about anaphylaxis or hypersusceptibility and an aggravation of all the symptoms of the disease. By the inability to control the liberation of toxins (tuberculin) manufactured in the body of a tuberculous subject, accounts for the failure in many cases to effect a complete cure. If the tuberculous foci are liberating large doses of the toxins at irregular intervals over an extended period nothing but disaster could ultimately result to that individual. Ringer states that "While the bacilli are mainly responsible for the local conditions in the lungs, the toxins are the cause of the emaciation, the loss of strength, the febrile temperature, the rapid heart action, the night sweats; in short, the constitutional manifestations. The origin of this toxemia of tuberculosis can be accounted for only by the assumption that the toxins and soluble proteids manufactured at the site of bacillary invasion are taken into the blood and lymph streams and carried to all parts of the body."

CLINICAL RESULTS.

The final test of all remedies must be clinical results. Theoretically there are many remedial measures that are lauded to the skies but when they come to the practical application prove dismal failures. This is not so with tuberculin. It has withstood the test of time. Enormous amounts of literature coming from masters in this country, in England and on the continent are lending willing testimony to its inestimable value. Many comparative tables are daily noticed in the various journals showing the benefit derived as a result of tuberculin administration as compared with the untreated patients subjected to identical environments, etc. In the Johns Hopkins Tuberculosis Dispensary, conducted by Hammand and Wolman, in which they recently report that they have had fifty-seven cases of pulmonary tuberculosis on tuberculin treatment (T. R. and B. F.) for at least ninety days with the following results: Ten patients were apparently cured, in sixteen the disease arrested, twelve were improved, in eighteen the diseased was progressive and one died. In selecting the cases the stage or the extent of the disease is not considered. In the out patient department of the Massachusetts General Hospital, Boston Consumptives' Hospital and the Good Samaritan Day Camp, tuberculin treatment was given the dispensary patients under the supervision of Drs. Hawes and Floyd. They report that out of 143 tuberculous patients treated with tuberculin (B. E. & B. F.) during the past four years, nineteen have died, sixteen have shown no improvement, while 108 have been benefited to

a greater or less degree. They claim that in no instance have they been able to see that tuberculin has done the slightest harm; reactions have been rare and invariably of a very mild type. In incipient pulmonary tuberculosis they regard tuberculin as a factor in increasing body resistance and in maintaining this resistance so as to prevent relapses. In more advanced pulmonary disease tuberculin will often alleviate distressing symptoms, prolong life and occasionally help to arrest the process. In localized or "surgical" tuberculosis, tuberculin has a marked beneficial effect. They conclude by saying that Dispensary patients can be treated with tuberculin not only with perfect safety, but with distinct benefit, providing that there is a close personal co-operation between patient and physician. Of course it goes without saying that the outdoor hygienic dietetic, etc., regime was rigidly adhered to. An interesting article by Lawrason Brown emphasizing early treatment of tuberculosis, appears in the New York *Medical Journal*, Nov. 20, 1909. He has compiled the ultimate results obtained at the Adirondack Cottage Sanitarium, covering twenty-two years. He finds that the records show that 52 per cent of the patients in an incipient stage, 25 per cent of the moderately advanced, and less than 2 per cent of those in the far-advanced stages are alive. In other words a patient in the incipient stage has at least twenty-six times as good a chance of permanent recovery as one in the far-advanced stage. He says that not every patient with tuberculosis will recover, no matter how early his case is diagnosticated, and no matter how soon put under the most approved treatment. But in an early case a patient has twenty-six times better chances for permanent recovery than in a late one.

PERMANENCY OF RESULTS.

The question of paramount importance to all patients after they have been apparently cured is whether or not they will remain cured. It is manifestly apparent that the results obtained in tuberculin treated cases are more permanent than in those treated without it. Patients who get well without treatment or with the usual open-air-hygienic dietetic treatment, are more apt to have a quiescence rather than a cure. This is shown by the fact that many of them will still react to tuberculin, which they would not do if they were cured, and also by the fact that a greater percentage of those suffer relapses than of the tuberculin treated cases. (Pottenger p. 203.) Trudeau, who has used tuberculin over a longer period of time in more cases and more conservatively than any other man in these United States, discusses the post-discharge mortality between patients treated and those that were untreated with tuberculin at the Saranac Lake Sanatorium. He says that 18 per cent more of the treated incipient cases are living than those of the untreated, while 25 per cent more of the advanced cases who received tuberculin are living than those who did not. In effecting a cure the struggle for mastery is essentially a local one. Lymphacytes are prominent in the formation of the tubercle, and the wandering leukocytes participate together with connective tissue cells in localizing the bacilli. If the organism is successful in effectually localizing the tubercle bacilli, a more or less rapid process of disintegration or bacteriolysis ensues which destroys the bacillus and disposes of its products. On the other hand in the so-called arrested cases where complete recovery has not taken place we find that in the center of the tubercle that a great many cells have died in consequence of the direct and prolonged exposure to the toxin, and caseation of greater or less degree is the common result. This caseated material really protects the enclosed bacilli from further lytic action by the living cells. Owing to the restricted action of the pent up tuberculin toxin, the body cells not composing the tubercle fail to get the proper stimulus to resist its action when the constitutional condition is in a favorable state for this. This fact forms the chief rationale for specific therapy in tuberculosis by tuberculins, for it

is desirable to impress the whole organism with the specific stimulus in sufficient quantities and at proper intervals to maintain a high resistance (E. R. Baldwin). If tuberculin were not used in these arrested cases you will be apt to find the fire still smouldering, sooner or later to break out into a serious conflagration. The pent up toxins in the tubercles are now at the mercy of the non-immunized body cells. Any immunity now that results often comes too late to be efficacious in saving life. By the employment of properly spaced doses of tuberculin in these cases there results a local stimulation of the tuberculosis foci (tubercles) which shows itself as a hyperemia thereby causing more blood to be sent to the part and consequently new protective substances are brought to bear upon the bacilli in the foci of infection. The area of infection previously lacking in vascularity is not only flooded with a greater amount of blood, but with a blood whose immunizing properties have been greatly increased. Again tuberculin does another thing, and that is it produces a more rapid formation of fibrous tissue around the foci of infection. The irritation caused by the local reaction on the tubercle is responsible for this fibrous tissue change. From this we can readily understand that the addition of tuberculin treatment must not only increase the chances of cure but must enable this result to be produced in a shorter time.

RESULTS DUE SOLELY TO TUBERCULIN.

The most convincing results as to the efficacy of the use of tuberculin comes from Bonney of Colorado.

He selected forty-two cases of chronic pulmonary tuberculosis without symptoms referable to mixed infection. It was recognized that all patients should represent, if possible, the same general type and stage of the disease, and conform more or less closely to a fixed regime. It seemed highly desirable that there should be eliminated all sources of confusion arising from climatic influence or change of environment. To this end patients included in this group were selected with extreme care. In view of the uncertainties attending its employment, no individual was permitted to undergo the treatment, whose general condition or previous progress had been entirely satisfactory, or who exhibited appreciable temperature elevation. On the other hand, an effort was made in the selection of cases to include only those who, in spite of a continued residence in Colorado, under appropriate conditions of daily life, had failed to secure an entire arrest of the tuberculous process. It was believed that more definite information concerning the effect of the treatment could be secured by limiting its application to those whose condition had been almost stationary for prolonged periods. Of all the cases comprising this group, the average period of residence in Colorado, with practically unchanged environment, was two years and eleven months, the longest being ten and one-half years, the shortest six months. A remaining activing of the tuberculous process was present in all cases, as evidenced by physical signs: cough, expectoration and bacilli. A new method of treatment was hailed with enthusiasm by these patients as precursory of possible future recovery, this introducing a psychic element impossible of elimination. In summing up he says that in no instance has he been able to detect permanent injury from the treatment. On the other hand, conspicuous improvements have been noticed in some cases. In the majority of the cases demonstrable progress has been established, but it is probable that in some cases the psychic element has been a factor of considerable importance.

A number of cases showed a material diminution of cough, and sometimes its complete cessation. The sputum has been markedly lessened, in many cases. In a few instances a conspicuous diminution of bacilli has been noted several months after the inauguration of this treatment. A gain in weight has been exhibited by several patients whose previous efforts in this direction had proved unavailing. In no case has there been a loss of nutri-

tion. Of the forty-two cases, he reports in detail ten cases showing marked improvement. Of the remaining thirty-two in this group, fifteen may be said to have exhibited some favorable effect from the administration of the remedy. In twelve there was no appreciable influence properly attributable to the tuberculin. Five exhibited an increase of cough and expectoration after each injection to such an extent that the tuberculin was suspended after three or four doses.

RESULTS.

Within the past six years I have been able to collect fifteen selected pulmonary cases in which thorough tests were given to fresh air, good food, carefully regulated living, rest, hydrotherapy, etc. With this treatment alone a distinct improvement was noted in all of the cases several months after its inauguration. Several continued to improve one year afterwards while others seemed to have reached their road's end in from three to six months in spite of everything that could be done in the modern way of treating tuberculosis with the exception of the employment of tuberculin.

The cases were favorable ones for the specific treatment. Many exhibited little or no fever. All had physical signs, cough, expectoration and bacilli.

Tuberculin was given with the following results:

Four cases cured or arrested.

Two cases improved as shown by gain in weight, lessened cough and expectoration and loss of bacilli. Physical signs are still apparent but much improved.

Four cases improved, as evidenced by increase in weight, diminished cough, and expectoration, with a marked diminution in the number of bacilli.

Five cases unimproved.

Out of this number I have at present six that I am administering the tuberculin with slow but progressive improvement. In a later communication I intend to discuss the entire fifteen cases in detail.

SHOULD TUBERCULIN BE USED ON A PATIENT WITH FEVER.

Pottenger is authority for the statement that a slight rise of temperature, due to the tuberculous process which does not exceed 101 degrees is best combatted by a combination of the open-air, dietetic, hygienic and tuberclin treatment. He says that it is not an uncommon experience to find a rise in temperature of this kind which has persisted for some time, yield in a short period to injections of minute doses of tuberculin.

Krause has recently obtained excellent results from the administration of tuberculin to febrile patients. He reports a permanent disappearance of the fever in all cases, and suggests at least a tentative administration of the remedy among a few patients who have resisted all other measures.

Bonney of Denver has quite recently had occasion to employ the tuberculin in six cases exhibiting persisting fever of from 102 degrees to 103 degrees F. daily despite prolonged rest in bed in the open air. In three cases no appreciable effects were noted; in one the temperature receded within a few days to normal and has remained so for four weeks; in two cases the temperature has gradually receded to the neighborhood of 99 degrees and 99.5 degrees F. That such injections act beneficially I have been able to prove to my satisfaction for the past few years. Repeatedly have I seen such temperature yield to this treatment when they had refused to yield until the tuberculin was given.

Theoretically the above contention seems unreasonable, for it is generally believed that the fever is due to the system's being surcharged with toxins from the tubercle bacillus; and, it would seem that to inject more toxins would be only adding fuel to the fire. Professor Wright offers us an explanation of this action. He says that not infrequently the machinery of immunization fails to work to its full capacity in spite of the fact that toxins from the invading bacteria are being poured out into the blood stream. At such times vac-

cines injected into the tissue may stimulate the formation of protective bodies where those circulating in the blood have failed.

CONCLUSIONS.

(1) The efficiency of tuberculin as a therapeutic agent has been proved to such a degree that it has passed beyond the pale of controversy.

(2) Its administration should always be combined with rest, hygienic, outdoor treatment and in the vast majority of instances should be subservient to this.

(3) I am of the opinion that equal parts of the "Bacillen Emulsion" and "Bouillon Filtrate" represent at the present time the ideal therapeutic agent for the treatment of tuberculosis; for the reason that the mixture would combine whatever immunizing properties that exist in either the tubercle bacillus or the culture fluid.

(4) Statistics show that more than twenty per cent more permanent cures have resulted when tuberculin has been employed than where it has been omitted. (Trudeau & Pottenger.)

(5) Many patients running a slow but steadily down hill course, in spite of hygienic, dietetic and open-air treatment, improve under tuberculin.

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TUBERCULOSIS*

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Tuberculosis, scientifically speaking, is implantation and growth of the tubercle bacillus in the tissues of a human being or a lower animal. The tubercle bacillus is a rod shaped bacillus about one six-thousandth of an inch in length and about one hundred thousandth of an inch in thickness. The word tuberculosis is derived from the Latin word tuber, which means a root or a lump. It came to be applied to the disease now known by this name in this way. When post mortem examinations were made on people who had died of consumption, it was found that there were in those parts of the lungs which had not completely been destroyed, little lumps ranging in size from a mustard seed to a chestnut. Sometimes large numbers of these tubercles were found, at other times only a few were present. Some were soft and some were hard, and sometimes cavities were found and it was thought that this represented the various stages of the disease. Therefore, the lumps were called tubercles and the process which produced them was called tuberculosis.

It has been proven by historians that tuberculosis, as we know it, has existed for at least three thousand (3,000) years, and it is reasonable to assume that the disease existed long before it was recorded in history. Moses is credited by Biblical scholars with a knowledge of consumption, and they claim that he had reference to this disease in his figures of speech in Leviticus 24:13-16, and in Deuteronomy 28:20-22. Furthermore, it is claimed by some that one of the plagues inflicted upon the Egyptians was consumption. Hippocrates, in the fifth century before Christ, gave us such a good description of its ravages as to seem now to be only an exaggerated picture of what we see around us at the present day. Galen in the second century after Christ gave us a description of the disease as he saw it among the Romans, and from Galen's day to modern times the story of the disease is much the same.

It is beyond the comprehension of man to realize what tuberculosis means to the world. The disease exists in every part of the habita-

*An address delivered at the Mass Meeting at the Y. M. C. A., Freeland, Pa., on April 24, 1910.

ble globe. Even the birds of the air and the fishes underneath the waters are not free from it. It is probably the direct cause of one-seventh of all the deaths in the human family in the world. Consumption is a disease of the poor and it hides itself in the dark corners. No one sees much of it at a time. If all of the tubercular subjects of any given community could be seen at one time to pass in parade before the people, we might realize something of the magnitude of the calamity. An earthquake swallows up a small section of the globe and the whole world is aroused with sympathy for the sufferers because of the dramatic feature of the calamity. A few thousands of deaths, however, are as nothing compared with the deaths from tuberculosis or consumption.

Tuberculosis is the great diseases of middle life. It causes about one-third of all the deaths that occur between the ages of twenty (20) and fifty (50) years. It is estimated that 200,000 people die annually in the United States from tuberculosis. During the four (4) years of our great Civil War the total loss of life was 205,070. In the same period of time in the United States alone the tubercle bacillus destroys over 700,000 people. When smallpox or yellow fever or any other contagious disease breaks out every possible effort is made to stamp it out, and yet the total loss of life from yellow fever in the United States during the last one hundred (100) years was less than 100,000. The annual total economic loss from consumption in the United States is $350,000,000. In Germany, the loss of life from this dread disease is nearly as great. The other civilized nations sustain similar losses annually from tuberculosis. Throughout all the world there probably are nearly a million deaths a year from this disease.

Popularly speaking tuberculosis and consumption are one and the same thing, but scientifically they are not. Consumption means destruction. Tuberculosis is caused by the implantation and growth of the tubercle bacillus. By itself this micro-organism does little harm and rarely produces death. If two other micro-organisms, the streptococcus and the staphylococcus could be kept out, the tubercle bacillus would run slowly through the life time of an individual without serious consequences.

The growth of the tubercle bacillus in the tissues, however, invites the streptococcus and the staphylococcus to those tissues by the injury it does, and when they get into the tissues they immediately associate themselves with the tubercle bacillus for mutual advantage and the destruction of the individual on whom they prey. The result is consumption.

The streptococcus and the staphylococcus are essential to the tubercle bacillus for the completion of its life's cycle. They do for it what the frost does for the chestnut, enable it to escape from imprisonment so that it may again start on a new cycle of life. They also protect it against its many enemies, especially fresh air and sunshine, until it can by chance be carried into new soil. When the streptococcus and staphylococcus get into a little tubercle they at once begin a work of destruction of the cells and produce the broken down tissue which serves as the covering for the tubercle bacillus. An ulcerative process is also begun by these associates and an opening is gradually made by which the tubercle bacilli again get into the outside world.

The first implantation of the tubercle bacillus even when associated with its allies, the streptococcus and the staphylococcus, rarely give rise to such symptoms as to attract much attention. When by the aid of its allies the streptococcus and the staphylicoccus, several successive crops have been harvested and replanted again in new soil, the host seeks the advice of a physician. He presents himself with these symptoms; a morning cough, or may be only a desire to clear the throat when he rises, a slight fever in the afternoon, a capricious appetite, pallor of countenance, loss of weight and profuse perspiration at night. Any or all these symptoms may be present, but he is suspicious of a tubercular lesion and a

careful examination by an expert will reveal the true condition.

The tubercle bacillus is the exciting cause of tuberculosis, and I shall comment briefly upon certain conditions which are called in medical parlance the predisposing causes of tuberculosis, which are: Race, age, sex, climate, dissipation, poverty, adenoids, enlarged tonsils, heredity and certain acute and chronic diseases.

The disease is met in all races. The Hebrew is least susceptible to it. The negro and the American Indian, living under civilized conditions, are especially susceptible to the disease.

Tuberculosis may occur at any age but in middle adult life the disease is especially likely to occur. Thus pulminary tuberculosis is most frequent between the ages of 20 and 35.

Females are slightly more susceptible to the disease than males, perhaps because their duties confine them more closely to the house than do those of the opposite sex. The progress of the disease becomes more rapid during pregnancy and lactation.

Regions which are subject to dampness and to sudden changes of temperature are most favorable to the development of the disease, possibly because under such conditions catarrhal affections which diminish the natural resistance of the body are so common. The disease, however, does occur in all climates.

The old ideas about heredity of tuberculosis are no longer held. Consumption is due to a micro-organism, and a child can not inherit it from its parent. Exceptionally parents may convey tuberculosis to their offspring, but as a disease, and not as a quality of body which may change into a disease. Consumption cannot be placed in the same category with traits of character, color of hair, and physical form. The qualities are essential to the organism. The transmission of parasites would be a different matter. The children of tubercular parents frequently contract the disease, but this is probably because sufficient care has not been exercised by the consumptive to protect those around him. He may have lived for years and expectorated freely on the floor and never disinfected the house. Thus the disease was truly contagious and not hereditary.

The adenoids and enlarged tonsils so often seen in children are a most potent factor in the development of tuberculosis. An adenoid is a growth in the back of the nose, which obstructs the passage of air through the nose to the lungs. Those with adenoids become mouth breathers. The nasal passages are so constructed that they filter the air which goes to the lungs through them and thus protect the lungs from the tubercle bacillus and other germs. By breathing through the mouth the air is not filtered and many harmful germs thus find an easy entrance to the lungs. Those with enlarged tonsils are subject to frequent acute attacks of tonsilitis, which are not only a source of great discomfort and loss of time from school work, but often receive the tubercle bacillus and entertain him until the system is so much run down that he gains admission to the lungs and other organs.

Dissipation is a scattering of vital forces by an excessive indulgence of any kind. Disease and death are the wages of sin. Transgression of the laws of nature is equivalent to transgression of the laws of God, and brings in its train a penalty which even though it come in the natural order of things may well be accepted as coming from God. Dissipation always strikes at the most vulnerable point, the nervous system. Whatever makes for lowered vitality makes for consumption. Degeneracy of the nervous system is the most powerful factor among the predisposing causes of consumption. Loss of sleep is an important factor in this nerve exhaustion. Especially is this true of the working classes who often work hard all day and frolic half of the night. The various kinds of stimulants play a double part in this physical wreck; they injure the nutritive system and at the same time spur on to greater abuse when the nervous system complains. The death rate from consumption is highest between the ages of 15

and 25 years. Yet this is the period of life which should be freest from diseases, because the exhaustion from the diseases of childhood is over and youth at this age should be vigorous and strong. The frequency of consumption at this age is probably due to the drain on the nervous system through the dissipations of youth.

Certain acute diseases play an important role as a predisposing cause of tuberculosis, notably influenza, pneumonia and the acute infectious diseases of childhood. These diseases leave the system in an exhausted and weakened condition and the tubercle bacillus finds a fertile soil for its development. Its allies, the streptococcus and the straphylococcus are in such cases already present, and when the tubercle bacillus has been implanted the three immediately begin their work of destruction.

Poverty is another great factor as a predisposing cause of tuberculosis. The poor live crowded together in tenements where sunlight and fresh air are shut out, and under conditions which are most favorable to the development of the tubercle bacillus. In the houses of the poor, the furnishings are old and filthy. Oftentimes the walls are covered by old paper which hangs almost in shreds, the carpets are full of dust and germs. Frequently the poor are unable to pay rent and have to move. A house recently occupied by a tubercular subject is vacated, but not fumigated. Another family, in whom the disease did not exist, moves into this house, whose floors and walls are polluted with the tubercle bacillus and soon one or more members of the family fall victims to the disease. Furthermore, the poor have not sufficient means to procure warm clothing so that all or the greater part of the food consumed must be used to produce heat in the body and the nutrition suffers.

Now, that I have spoken briefly of the causes of tuberculosis and consumption, I shall say something about the prevention of it. When the causes of tuberculosis and those conditions which favor its development are known, its prevention is not a difficult problem. I have told you that the disease was caused by a germ getting into the lungs or other organs of the body, and that its development was most rapid in those whose systems were run down either by dissipations, overwork or acute or chronic diseases, especially in the absence of fresh air, sunshine and nutritious food. Now, to bring the question home to us, I say that in Freeland, where we are blessed with an altitude of about 2,000 feet, with a dry and equable atmosphere, with an abundance of fresh pure air and sunshine, there are too many cases of tuberculosis. We must do something to stop it and I trust that my hearers this afternoon will leave here with a desire to teach a gospel of right hygiene and cleanliness. Fresh air, sunshine and good nutritious food are the greatest foes to the tubercle bacillus, and it is through its foes our greatest blessings, together with right living, that we may prevent tuberculosis. It is a crime for parents to shut out all sunshine and especially all fresh air from the living rooms of their children. No greater mistake was ever made than to keep all windows closed down tightly in a bedroom where one or more people sleep. Let the fresh air come into every sleeping room every night in the year, no matter how cold. No harm can come from it, provided the sleepers are warmly clad. I tell you truthfully, that in my daily visits to the sick room, I am frequently most uncomfortable on account of foul and stuffy air in the room. To remain in such a room for twenty-four (24) hours would make me sick indeed. I remonstrate to the one in charge of the sick room about the necessity of ventilation, but alas, too often the remonstrance is useless. Even in this cold climate, I have advised mothers whose babies and young children were suffering from pneumonia, to dress them warmly from head to foot, leaving exposed only the mouth and nose, and to take them out in the fresh air and sunshine and leave them out for the greater part of the day. When this advice has been adhered to, the re-

sults have, without exception, been most favorable. In every modern children's hospital today fresh air and sunshine in large doses play a most important role in the treatment of lung diseases. As soon as the people realize this they will become stronger and more healthful. It is a step in the right direction when the mothers or nurses parade the streets in fair weather with their babes in their carriages. It's a good sign, and the more of it I see, the more delighted I am.

It is also a wrong idea to shut out all sunshine from a room by curtains and dark shades. The germ which causes consumption cannot survive in the sunshine. Let the fresh air and sunshine in the house and let everybody spend as much time as passible out of doors.

In regard to the prevention of tuberculosis in children I wish especially to emphasize the importance of removing adenoids and enlarged tonsils. The presence of adenoids in a child will make it become a mouth breather, lower its mentality and may be the cause of its getting tuberculosis. Likewise the enlarged tonsil should be removed. In New York City and Philadelphia, where school children are inspected periodically, those children with adenoids and enlarged tonsils are not permitted to attend the schools until these growths are removed. It should be so here, because the child with adenoids and enlarged tonsils will not make as rapid progress either mentally or physically as it otherwise should. It is my personal opinion that any parents who permit their child to suffer from adenoids and enlarged tonsils are guilty of doing their child a great injustice. Instead of parents being afraid to have this operation performed on their children, they should be afraid to refuse it.

The proper conduct of one who has consumption in regard to its prevention in those associated with him, is summed up in one word—cleanliness. He must spit into a sputum cup with a handle on it, so that the sputum laden with the germs of consumption can be destroyed. He should not spit on a handkerchief and then put it into his pocket, because then the pocket would become contaminated. He should hold a paper napkin over his mouth when coughing or sneezing, so that the germs will not be disseminated in the room. He should sleep alone and avoid kissing anyone on the mouth. His every action and everything about him should be the embodiment of absolute cleanliness. Not only does the tubercular subject protect others from the disease by his practice of cleanliness, but in this also lies his own salvation, for unless he be clean and sanitary his disease cannot be arrested.

Houses recently occupied by a consumptive should be fumigated thoroughly before another occupant moves in. In the observation of this practice a great step is made in the prevention of tuberculosis.

In regard to the prognosis of tuberculosis, it gives me great pleasure to bring you a message of gladness. For ages the people, and until recently even the physicians themselves, believed that tuberculosis was an incurable disease. Thanks to our present knowledge of tuberculosis, it is a curable disease. Nature herself endeavors to throw off the disease and often without other aid is quite successful. In order to be cured in most cases it must be early recognized and treated wisely and along hygienic and sanitary lines. The earlier physicians believed it incurable because they did not recognize it until the sufferers were moribund. At the present time, however, the modern physician can truthfully promise, in many cases, to arrest tuberculosis when early seen. There is a tendency among the masses of the people to regard tuberculosis and consumption today as incurable. They think that if the tubercular subject has his disease arrested, the diagnosis was not correct. And yet consumption is a most curable disease. Autopsies show that about 75 or 80 per cent of all people who die have been infected with tuberculosis at one time or another during their life. These sta-

tistics show absolutely that the disease is curable sometimes even without treatment.

On the treatment of tuberculosis I have only a word to say. Its rational treatment must resolve itself into right living with an abundance of good nourishing food, plenty of fresh air and sunshine, all under the direction of a capable and honest physician.

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5 *Center Street.*

REPORT OF A CASE OF DOUBLE IDENTITY*

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While disturbances of the personality are quite common, those of so marked degree as to produce the condition spoken of as "double identity" are infrequent, and will never cease to be a source of interest and remark. Such cases, indeed, are amongst the most wonderful phenomena known to medicine. The case which I will report below is a classical one, and may be taken as the type.

I shall not attempt to enter upon a complete and technical discussion of these disorders and their morbid phychology, but before passing on to the case history, a few words dealing with the subject in a very general way will be in order.

The personality is the *EGO*, the mental man, the *I AM*. It consists of the entire intellectual patrimony of mental images, or memories, and their multitudinous associations, analyses and syntheses. This is necessarily not a fixed quantity, but normally undergoes changes as a result of new experiences and new knowledge gained. The normal, natural, healthy personality of an individual will be that resultant arising from the harmonious and undisturbed association and orientation of all his past experiences, conscious and unconscious. Disturbances of this personality, technically spoken of as dissociations of the personality, arise when there is a break or interference in this process of association and orientation. Such disturbances or dissociations are familiar to you all as exemplified in mental diseases and toxic states. That particular class of dissociations which I would speak of here especially, that result in conditions denominated "double identity," are those wherein there is such an interference with the mental associative processes as to so change the whole character of the person as to practically convert him into another individual so far as his mental attitude toward the world, his aspirations, motives and impulses are concerned. The result is, so to express it, that today he is one person and tomorrow another. In the extreme case, as the person passes into the state of secondary identity he has no memory or recollection of his past life, and vice versa, when he returns to his normal self, he has no recollection of what transpired during the period of dissociation. For the sake of identifying these personalities, they may be designated as "A," the normal, and "B," the dissociated state. There may, too, be multiple personalities, so that the individual may be successively A. B. C. D, etc., each successive state being without knowledge of the other. Occasionally, however, even when the change has been so marked as to produce a very profound change in the character, habits, aspirations and aptitudes of the person, there is yet more or less knowledge and recollection of himself and his doings in the other state of personality, recalled fragmentarily

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and as in a dream, conditions that are spoken of as "co-conscious" states. In multiple personalities some may be co-conscious and others not so. Thus A and C may be co-conscious, though neither knows of B. Of course the more striking and phantastic examples are those in which the subject, while as personality A, has absolutely no memory or knowledge of the doings of personality B, and conversely. Such is the nature of the case which I shall report to you.

These conditions arise in the course of two of the major psycho-neuroses, hysteria and epilepsy, in somnambulistic states, and perhaps in those who are only nervously unstable. In epilepsy they may be in the nature of an "equivalent," taking the place of a convulsive seizure. The duration of the attacks is exceedingly variable, from a few hours to a year or more.

A. C., male, age 40, German Jew, was referred to me several months ago by Dr. Perry Bromberg.

Patient related a history that indicated the occurrence, during the past six years, of several periods of secondary personality, lasting from a few hours to several months, during which he left home and business, took up new avocations, and had no knowledge of his former life, and upon his restoration to his normal personality, these periods remained as absolute blanks in his memory, and of them today, some years afterward, he still knows nothing other than a few isolated facts that he has been able to discover through investigation.

At the time he consulted me he was constipated, had no appetite, felt mentally obtunded, suffered from a feeling of dull, heavy pressure in the back of his head, and was in an anxious, apprehensive state through fear that he was on the verge of another one of his attacks. This fear proved groundless.

Sixteen years ago he had an apoplectiform attack. Left arm and leg completely paralyzed for several days. This entirely disappeared in five or six weeks. The face was not affected. The tongue was "clumsy," but there was probably no true aphasia. He has had "absent states" simulating petit mal, and has awakened in the mornings with sore tongue, but he does not himself believe this was due to having bitten it.

He possessed a full and complete insight into his condition, and a correct understanding of it.

The following is his history as he related it, and as subsequently verified by his wife:

He was born in Germany and came to the United States in 1892. He was married first in 1895, and lost wife and three children in 1898. Married a second time in 1905. He is a Jew by birth, but has been converted to Christianity, and his second wife is a Gentile.

His first attack came in July, 1904. He was then living in Atlanta, Ga., where he was employed in newspaper work. He was doing well in business, was in good general health, was not troubled about anything, and enjoyed the most pleasant social connections. Being greatly interested in religious affairs, he did a great deal of preaching at night. One afternoon in July, 1904, he boarded the train for Louisville, where he expected to enter the Baptist Theological Seminary to do some special work. The next he knew he found himself in Battell, Ala., in the latter part of December. Upon awakening that morning he found himself in a dirty room in a common, low-grade boarding house. He went downstairs and asked for his bill, when he was told that he had settled it two days before, from which he judges that he must have been there at least nine days, since it would be at the end of a week that he would naturally settle. He discovered the name of the town when he went to the depot to leave. He found out later that he had been preaching in Gadsden, Ala., which he learned from remarks made to him by a preacher whom he met afterwards. A period of five months is a complete blank to him, and he has no idea by what name he was known during that time, and from embarrassment he would not ask any questions of the

preacher who had known him in Gadsden. While he had a few dollars in his pockets, he had not, at the outset, sufficient funds to have supported himself through this period of five months, so he must have earned some money in some way.

He now went to Birmingham, where he was successful in work, and he married a second time in June, 1905. His wife became very ill in October, and was sick for the succeeding nine months. This worried and harassed him, and he was under a heavy financial burden. He had several lapses of a few hours each during this time.

In August, 1907, he left Charleston, S. C., where was was then living, doing newspaper work, for Orangeburg, to visit over Sunday with a friend. He realized that he was not well, and had for some time been preparing to wind up his business preparatory to entering a sanitarium for treatment. After a certain point in this journey from Charleston to Orangeburg he remembers nothing of himself until he came partially to himself in Macon, Ga., in November, 1907. This awakening was not complete, however, and there was established a third personality. If we call his normal "A," we may designate the personality of the two periods from July to December, 1904, and from August to November, 1907 (assuming these to have been the same), as personality "B," and that which I am about to describe as "C." In this latter he came to a partial recollection of himself then, but did not know how he had gotten to Macon, and the period of three months from August to November was and is a complete blank to him. He did not exactly know his name, but used one somewhat similar. So complete was the amnesia for his past that he had no memory of his last marriage, and married a third time, thus constituting himself a bigamist. For the year succeeding his partial awakening he did not remember that he had been converted to Christianity, so that he reverted to his former Jewish faith, but took no special interest in it, in contradistinction to his former great activity in religious affairs. He realized his condition, but pretended that he had been in trouble, and thus explained to prospective employers his inability to produce references. He was in an active mental state, so that in six months he worked himself up from the bottom to the position of head of a department in a large furniture house. He was still absolutely without memory of his past, try hard as he would to remember it. Some fifteen months after his departure from Charleston he was seen and recognized by a man from that city, who notified the patient's wife in Charleston. Up to this time his wife, number 2, believed that his leaving her was a case of simple malicious desertion, and when she discovered him in Macon and married to another woman, she at once instituted proceedings against him for bigamy. Subsequently, however, she, the prosecuting attorney, and the court became convinced of his mental abnormality. The third marriage was annuled by the court, and he and his lawful wife were reconciled. I have read a letter from the judge, expressing his complete conviction of the patient's mental abnormality and of his uprightness and lack of intent to do wrong. After his reunion with his lawful wife, the patient's memory of his past gradually came back to him, except for the two periods above described and for the short lapses of a few hours each. This return to his normal identity was broken by brief periods of confusion and dissociation for three or four months, and for a long while he was hazy on many points of his previous history that should have been perfectly familiar to him. These matters were gradually recalled to him by things told him by others, but even at the time he consulted me he had some trouble in exactly remembering some things that should have been at his tongue's end—the date of his marriage, for instance, which he uncertainly stated to have been in June or July, 1905.

It is quite difficult, if not impossible, to here mark definitely the border line between

personality "C" and his normal, or "A," the former gradually shading into the latter.

From the time he consulted me in October or November last, until about the middle of April, 1910, he seems to have remained as personality "A," and was regularly employed in a furniture house in Nashville. About the middle of April last, however, another transition occurred, and he suddenly left Nashville without notice to his wife or employers, and, so far as I know, has not yet been located, though during the six weeks that he has now been absent she has made most persistent efforts to do so.

The exact nature of this case so far as the causative explanation is concerned is not perfectly clear to me. It is possibly epileptic in character if the "absent states" of which he gives the indefinite history related above may be looked upon as petit mal.

The only treatment suggested by writers on the subject is hypnotism, the patients being given such suggestions while in the hypnotic state as will tend to reintegrate the normal personality.

The City View Sanitarium.

THE TREATMENT OF VARICOSE VEINS OF THE LOWER EXTREMITIES

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By the term varicose vein we mean a vein which is permanently elongated and dilated and usually tortuous. These veins undergo various pathological changes. They may be very tortuous, dilated and thin—or very much hypertrophied, the media becoming replaced by fibrous tissue and, in some cases, we only have a hard tortuous, occluded tube with areas of calcareous degeneration present.

Just what produces varicose veins we are at times unable to answer with accuracy and to our satisfaction, but we know that they are brought about by an interference in the vein wall, its valves or enervation. No doubt a large per cent of cases are congenital and are made worse by some exciting cause, like the wearing of tight garters, standing for long hours daily, muscular strain brought about by professional cyclist, interfering with the deep veins by pressure and producing a compensatory dilation of the superficial veins—repeated pregnancies, tumors pressing upon the deep veins, a thrombus of the venæ comites—Phlebitis, Arterio-Sclerosis and an interference with the functions of the vaso-motor nerves play an important part in their production, also the anatomical position of the veins, by being placed outside of the strong supporting fascia of the leg. What method shall be employed in the treatment of these veins? The surgical treatment is as old as Celsus, but was abandoned on account of Pyæmia, until we could accept the truths of Lister's discoveries. Certainly the larger per cent of cases can be treated surgically, but to treat all cases systematically surgically would be unpardonable. We must study and select certain cases for operation, for our percentage of cures will probably not exceed those given us by Goerlich, who reports 1,425 cases, with only from 65 to 85 per cent cured.

To be successful we must find out first whether the deep veins are diseased; we may have a thrombus or some other obstruction to the deep veins and the dilation of the superficial veins may be only a means on the part of nature to carry on a physiological function. Test your patient by bandaging from the toes

up above the knee for a week or longer and see whether he or she is made worse or better by the pressure. If there is an obstruction to the upward flow of blood via the deep veins, the patient's pain, œdema, heavy and uncomfortable feeling is made much worse, then an operation should not be done; but if by pressure on the superficial veins (which are varicose) the symptoms are relieved, we know then the venæ comites are patent and that by the proper cutting off of this circulation our patient may get well, but do not operate hurriedly or thoughtlessly and tie off the only way by which the venous blood has to return to its normal channels.

If the deep veins are affected, or the patient has a constitutional fault, which renders him unfit for operation, or he refuses an operation, then rest in bed—the wearing of an elastic bandage, or better still the inelastic "leg corset" of Murphy will give temporary relief. The above treatment can be greatly aided in case of ulcers by a suitable ointment and active hyperæmia.

If the case is an operative one, what operation shall we perform? The above question is hard to answer and can only be answered in a casual way, for no surgeon operates on his cases alike, but is influenced by circumstances which each individual case presents. If the Trendelenburg phenomena is present, the ligation of a section of the Internal Saphenous just below the Saphenous opening in the fascia as advocated by Trendelenburg will effect a cure; if the Internal and External Sapheni and all of their tributaries are dilated the Schede's method, and if accompanied by ulcer its modification by Moreschi will prove effective; if there have been several inflammatory attacks with marked ulceration and extensive adhesions and it is impossible to do a Schede's, Mayo's, Phelp's, Lodderhose, or other operation, the Freidel's or Rindfleisch operation will probably serve a useful purpose.

I have operated upon several cases by the subcutaneous method of C. H. Mayo, which consists of a resection for about six inches above and six inches below the knee of the Internal Saphenous, which method obliterates its tributaries, cuts off its branch to the deep vein, cuts off the branch of the External Saphenous, which communicates with the Internal Saphenous at the knee, causing it to empty entirely into the Popliteal.

Below are reports of a few cases which attest to its practicability and usefulness:

Case 1—W. D., 28, S. C., entered the hospital on July 3, 1909, suffering with a large varicose ulcer of leg. Leg was swollen, and pained him so much he was unable to work with satisfaction.

On July 30th, after the proper preparatory treatment, his Internal Saphenous was excised for about six inches above and six inches below the knee, ulcer was curetted and skin drafted.

Kept him in bed about fifteen days—foot elevated and leg bandaged from toes up to upper third of thigh. He made an uneventful recovery. Had been suffering with varicose veins for six years.

Case 2—Mrs. F., 28 years of age, widow, one child, white; occupation, nurse.

Was compelled to give up her occupation on account of varicose veins in her right leg, which she had suffered from for the past few years. Was confined about half of her time in bed.

Operated in the spring of 1908—found veins badly dilated, very thin and sacculated in places, broke in two places while removing. Resumed her occupation as a nurse three months after operation, and has had no pain, swelling or other inconvenience in her leg since. Recovery perfect. Gave a previous history of an inflamed and swollen leg, following a confinement.

Case 3—Colored man 60 years old. Came to the City Hospital in May, 1909. Was unable to stand on account of pain in right leg. Had been unable to stand and work for past few months—leg swollen and veins very much enlarged in places; very thin in parts of veins and at other places very hard and lumpy.

Physical condition very poor, had an organic lesion of heart, so hesitated for several days before I would risk giving him ether. He stood the ether badly, but in four weeks he was able to get about as usual and walked from the hospital apparently cured.

Gave a previous history of Phlebitis, following a long spell of fever.

Case 4—Mrs. S., age 43; white.

Had suffered for several years with varicose veins; condition gradually became worse by repeated and frequent pregnancies. Confined to bed the greater portion of the time. Left leg entirely ulcerated (except small area), veins very thin, dilated and knotty in places. Physical condition and hygenic surrounding very poor. Leg had been kept bandaged (improperly) for last few years. Veins had ulcerated through at times and had small hemorrhages.

Operated upon her about three years ago. Veins very much degenerated, and broke in four places when removing.

She was compelled, on account of her finances and sickness at home, to leave St. Joseph's Hospital in a few days after operation. Could not take the proper rest after getting home on account of baby, which died in two weeks.

Patient very much improved.

The above cases are cited to illustrate the good results that might be obtained in selective cases.

Three of the cases were entirely relieved and the fourth, which was one mass of ulcers, atrophied and the skin very adherent and she did not receive the necessary post-operative treatment, yet greatly improved by operative interference.

I have had some experience with other operations for the relief of varicose veins—also a larger experience with subcutaneous enucleation than the cases just cited, but I believe the modification of Narath's method by Mayo (the subcutaneous euncleation) will suit the larger number of cases applying for surgical aid than any other method. At times in the above operation other veins will also have to be ligated, but from an anatomical standpoint it fulfills almost all of the requirements. I think it superior to the open longitudinal incision as practical by Terrier and Alglave, or better than the resections of sections by Madelung, or the modification by Schwartz, Lodderhose or Casati. It is easier and more certain than that of Kellar or Narath.

In cases where we have a calcareous deposit sacculation or the vein wall very thin, it is better to do the open operation. Varicose ulcers should be exercised and skin drafted at time of vein removal, and if attended with much pain, the stretching of the nerves as advised by Chipault will prove successful.

The advantages to be gained by the subcutaneous enucleation (if practical to do) are —it lessens the danger of infection, lessens the chances of an embolus gaining access to the circulation; it is very much more bloodless and there is very much less danger of injuring the Sapheni nerves; it is quicker to perform, thereby causing less danger from shock, and the ill effects that occasionally follow an anæsthetic, and last, but of little importance, more cosmetic.

410-14 *Randolph Building.*

A FEW ANIMAL DISEASES OF INTEREST TO THE GENERAL PRACTITIONER OF HUMAN MEDICINE*

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The title of this paper suggests the necessity for the study of comparative medicine by the human as well as by the veterinary practitioner. To obtain the requisite amount of knowledge of comparative medicine, the relationship of human and veterinary medical science should be brought into closer contact. In other words, the practitioners of these two great branches of medical science should cooperate to the fullest meaning of the term, and work together hand in hand for the relief of suffering humanity and the uplift of the human race. Knowledge disseminated in such a manner would be well and thankfully received.

From the standpoint of science, animal diseases of any nature should interest the human physician, but he should be doubly interested in those diseases of animals which are transmitted directly or indirectly to the human race.

The diseases which are directly or indirectly transmissible to man are not so numerous but that any progressive practitioner could, by a little study, master them. The law of self preservation should impel him to do this if for no other reason.

The time has long since arrived when the human practitioner, as well as the practitioner of veterinary medicine, should have a more comprehensive idea of the scope and extent of available knowledge of comparative physiology and comparative pathology. I dare say that none of you who are present on this occasion will gainsay the above assertion. The relationship of diseased meat and impure milk to public health is a question which should vitally interest every one, especially the general practitioner of human medicine. The proper regulation and control of a municipal meat and milk supply requires stringent laws and their diligent enforcement under the direction of a well qualified and non-political Board of Health. In their enforcement the Health Board should avail themselves of the united services of the bacteriologist, the chemist, the physician and the veterinarian, together with the co-operation of the progressive dairyman and butcher.

The individual technical knowledge of any of the above-mentioned scientists is not sufficient to cope with so complex and momentous a problem. Their united knowledge, together with their most diligent efforts are absolutely necessary if the public health is properly subserved.

The diseases of animals that should be of special interest to the general practitioner of human medicine, are those diseases which are transmissible to man directly through the medium of meat and milk or those which are transmitted by direct contact or direct contagion.

In the light of our present day knowledge, the qualified general practitioner of human medicine should be able, without hesitation or unnecessary delay, to make a reasonably correct diagnosis. He should furthermore be able to as quickly recognize the possibility or probability of the disease in question being of animal origin. If from animal origin he should say without hesitation whether it has been transmitted through meat or milk or by direct contagion.

I shall not burden the members present in enumerating the various symptoms of the numerous diseases as observed in the animal. Neither shall I go into any elaborate description of any of them, as that would be as useless as it would be burdensome. Suffice it to say that most of the diseases that will be mentioned, present definitely well defined

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symptoms whereby their diagnosis is made easy to the qualified veterinarian.

ANTHRAX.

Anthrax is a true septicæmia caused by the bacterium anthracis and is one of the oldest of the known infectious diseases of animals. It is readily communicable to nearly all warm blooded animals.

It is communicable to man by the alimentary tract through the medium of meat and milk or any other food containing anthrax bacilli.

It is transmitted by infection of skin wounds, and in this form is known as "Carbuncle Disease," on account of its local manifestation. By inhalation the bacillus may enter the respiratory tract.

Anthrax is of especial historical interest from the viewpoint of bacteriology, as it was the anthax bacillus which has the distinction of being the first disease producing germ, stained, isolated, cultivated and described by the late Professor Robert Koch in the year 1875. This was the beginning of our present day knowledge of bacteriology.

GLANDERS.

Glanders is a contagious disease of the horse and many other animals. It is directly transmissible to man by actual contact with the glandered animal or by handling harness, currycombs, brushes or other articles which have come in contact with the infection. It is caused by bacillus mallei, and chiefly attacks the lymphatic system. Glanders rapidly terminates fatally when it attacks man. However, horses may linger for months or even years with this loathsome and dangerous malady. Veterinarians, stable attendants, and others closely associated with horses are particularly liable to infection.

FOOT AND MOUTH DISEASE.

Foot and mouth disease is a highly contagious disease of animals, especially cattle. Its specific germ has not yet been isolated and cultivated. It manifests itself by ulceration around the feet and in the mouth. Foot and mouth disease first appeared in America in 1870, was stamped out after spreading over several of the Eastern and New England States. There has been at least two other widespread outbreaks during recent years which caused great anxiety and heavy financial losses. America is now free from foot and mouth disease infection. However, it is liable to reappear at any time from foreign sources unless rigid quarantine measures are constantly enforced. This disease is transmitted to man through the medium of milk from affected cows.

TRICHINOSIS.

Trichinosis is a parasitic disease due to trichina spiralis, which become imbedded in the muscular tissue of animals, principally swine. This disease is transmitted to man through the medium of infected meat, which has been eaten raw or imperfectly cooked. Upon the ingestion of meat containing living trichina the parasites are liberated through digestion of the parasite containing sacs and their surrounding capsules. These in time develop into mature worms in the intestinal tract. The male parasites only live for a short time. After death they are discharged with the feces, while the females penetrate into the Cripts of Lieberkuhn and deposit their young. These young parasites are taken into the blood and are deposited by it into all parts of the body, thereby gaining access to the muscle tissue. After becoming embedded in the muscular tissue they begin to migrate or wander in different directions, which accounts for the excruciating pain of this disease. Not less than 2 per cent of all American hogs are infected with trichina spiralis. When this parasite invades man the mortality will average 30 per cent.

COW POX.

The specific cause of cow pox (variola bovina) is not definitely known. A number of different micro-organisms have been isolated, but no experimenter has yet been able to reproduce the disease in other animals by the injection of either one of the suspicious varieties yet found. We do know that the virus

of cow pox is quite virulent unless exposed to direct sunlight or to the action of germicides.

In the absence of vaccine protection cow pox is readily transmitted to man by direct contact with affected animals.

ACTINOMYCOSIS.

Actinomycosis is an infectious disease caused by the ray fungus.

This fungus gains access to the tissues, usually the cheeks, jaws or tongue of cattle, through wounds or abrasions in the buccal mucous membrane. These fungi multiply, and by their irritating effects on the soft tissues and bone, stimulate the formation of new growths, which in many instances attain great size. These masses have a tendency to suppurate and sometimes slough. The natural habitat of the ray fungus is on grasses and plants, rye and barley, the beards of which penetrate or abrade the mucous membrane, thereby allowing the fungus to invade the tissues.

Inhalation of the fungus produces nodules in the lungs which, at a casual glance, may be mistaken for tuberculosis. Actinomycotic leisions have been observed in every organ of the body, but in the great majority of the cases the jaw alone is involved.

When the udder of cows contain the actinomycotic nodules the ray fungus may escape into the milk and thereby infect man.

Man may also become infected through the medium of eating raw or imperfectly cooked meat from actinomycotic animals. Especially is this true when the affected parts are used for human consumption. It may also be transmitted by infection of open skin wounds which have come into contact with the fungus containing pus.

TAENIA ECHINOCOCCUS.

Tænia Echinococcus is one of the most widespread tape worm infections of dogs found in this country. Many other animals, including man, harbor the cystic form of this parasite. These ova (Echinococcus Polymorphus) are the direct cause of hydatid cysts of man, who is its intermediate host. In the cystic form it is an extremely dangerous parasite. This disease is spread by dogs devouring the parasite—containing offal from infected hogs, cattle and other animals. The detached segments of the tape worm pass from the dog with the faeces to the ground, where they liberate numerous ova. These ova, or microscopic eggs, become distributed over the ground and finally contaminate the water and food supply of man. In man the hydatid cysts may develop in the brain and elsewhere, producing distressing symptoms and fatal results. Hence it will be observed that the destruction of echinococcus containing organs and parts of infected carcasses by the Meat Inspector is of great health and sanitary value.

BEEF MEASLES.

Beef Measles is the larval stage (Cysticercus Bovis) of the common "beef tape worm" (Tænia Saginata) of man. The ox is its intermediate host. The ovum, upon reaching the stomach of the ox, is hatched into an embryo, these embryo penetrate the tissues and gradually migrate to various parts of the animal's body, where they form cysts (Beef Measles). Should a human being eat raw or imperfectly cooked beef infected with these cysts containing the living larva, they would become infected with that widely distributed tape worm known as Tænia Saginata.

PORK MEASLES.

Pork Measles is the larval stage (Cysticercus Cellulosæ) of the common "pork tape worm" (Tænia Soleum) of man, which is, as you all know, the armed tape worm, and difficut of removal. Each segment which is passed to the ground with the feces contains many ova. The ova infect the water and food supply of the hog, which is its intermediate host. In the hog's stomach the ova hatch the embryo, these embryo pentrate the intestinal wall and migrate into the muscular and other tissues where they form cysts (Pork Measles). Should man eat raw or imperfectly cooked pork infected with the cysts con-

taining live larva he would become infected with the tape worm known as Tænia Soleum.

BOVINE TUBERCULOSIS.

There is available at the present time indisputable evidence to convince the most conservative that Bovine Tuberculosis is readily transmitted from the cow to man through the medium of milk, butter and meat. When we realize that not less than 10 per cent of the dairy cows supplying Nashville with milk, have been found by tuberculin test confirmed by post-mortem examination, to be affected with tuberculosis, we are warranted in concluding that a certain per cent of the tubercular patients in Nashville contracted the disease from bovine sources. It was only last week that the writer found twenty-two tubercular cows in a single dairy herd which was supplying Nashville with milk. The local situation warrants the more stringent enforcement of the present laws relative to dairy inspection. While our present system of dairy supervision is better than formerly, I have no hesitancy in pronouncing it a mere farce in many respects.

RABIES.

Rabies is an acute infectious disease transmitted from animal to animal or from animal to man by the bite of rabid animals or by direct inoculation. It is not possible to transmit rabies through the medium of milk or meat of affected animals, neither is it possible to become infected by mere direct contact with the rabid individual. Rabies appears most frequently in the dog, and by him is disseminated to other animals, usually in a circumscribed neighborhood, and the result is that numerous human beings may be bitten before all the affected animals are destroyed. All warm blooded animals are susceptible to rabies. The period of incubation varies from eighteen days to as long as two years. The infective virus of rabies exists in the spinal cord, brain and saliva of the affected animal; it has never been found in the blood. It is not necessary for me to enumerate all the symptoms of rabies as observed in dogs. Suffice it to say that whenever a dog is observed with lower jaw dropped (mouth open) and dirt on tongue, the case is suspicious and the animal should either be killed or confined. If a person has already been bitten, never kill the dog until it has been examined and the case diagnosed by a qualified veterinarian, after which have the veterinarian's diagnosis confirmed by a basteriologist. The finding of negri bodies is diagnostic. If the animal is really rabid then, without hesitation or unnecessary delay, suggest Pasteur treatment.

In conclusion I would like very much to emphasize the importance of a Chair of Comparative Medicine in each medical college faculty, and the necessity of each practitioner of human medicine devoting at least a part of his leisure time studying comparative medical science. If a man can afford to devote three years to the study of veterinary medicine and four years to the study of human medicine, making a total of seven years of his life to the study of medical science in order to qualify himself to treat horses, dogs and cats, then how can there be any valid objection to at least requiring a prospective practitioner of human medicine to better qualify himself before undertaking the responsibility of dealing with valuable human lives?

Nashville Veterinary Hospital.

LUMBAR PUNCTURE*

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HISTORICAL.

About twenty years ago Quincke, after much experimentation on dogs and rabbits, perfected the technique of lumbar puncture and used it as a measure to relieve increased intracerebral pressure in a case of acute hydrocephalus. The relief which attended the operation was so marked that Quincke was led to repeat it in this case and use it in several other cases of a similar nature. He was very enthusiastic as to the beneficial effects of the operation. The same success was not claimed by others who used the puncture. Notably among these was Lichtheim, who, however, recognized in it a valuable aid to diagnosis. The chemical and bacteriological investigation of the cerebro-spinal fluid was pursued by German investigators. This was soon followed by the studies of French scientists, including cytodiagnosis, chromodiagnosis, cryoscopy, etc. About the same time Bier's article on medullary anæsthesia appeared and Quincke's puncture was taken up by the French surgeons, especially under the lead of Tuffier, possibly with a premature enthusiasm as a means of inducing anæsthesia. So that lumbar puncture has come to be a procedure which forcibly illustrates the interrelation of the various branches of medicine engaging the attention of the surgeon, neurologist, otologist, pathologist and internist.

A full consideration of lumbar puncture would require a discussion of it as an aid to diagnosis, as a therapeutic measure, and as a means to induce anæsthesia. At this time I desire to consider it as a diagnostic and therapeutic measure.

ANATOMICAL AND PHYSIOLOGICAL CONSIDERATIONS.

At the outset it will be well to review briefly the anatomy and physiology of the spinal canal and the cerebrospinal fluid. The central nervous system is enclosed in a bony case formed by the bones of the cranium and the bodies, arches and processes of the vertrebræ. The brain and cord are covered by three membranes from without in the dura, arachnoid and pia.

"The dura mater, a dense fibrous tissue membrane, divisible into two layers and lined in its inner surface by endothelium, lies in close contact with the inner table of the skull and is continuous as a fibrous sheath on to the cranial nerves. Three prolongations of the dura mater, the falx cerebri, tentorium cerebelli and falx cerebelli, extend into the cranial cavity and play an important part as supporting structures. The dura mater is for the most part irrigated by the middle meningeal artery, while the trigeminus is the source of its nerve supply.

"The arachnoid mater and pia mater, the leptomeninges, are commonly described as the "pia arachnoid," since diseased processes which affect the one always involve the other. The pia mater is a thin vascular layer of fibrous tissue which lies in the closest contact with the outer surface of the central nervous system. A prolongation of the pia mater, the velum interpositum, passes into the transverse fissure of the brain, carrying with it the choroid plexuses. The arachnoid on the other hand is a nonvascular fibrous tissue membrane. It lies external to the pia mater with which it is connected by a delicate network of fibrous tissue strands and it is covered on its outer surface by a layer of endothelial cells. The arachnoid does not dip into the sulci as does the pia mater, but bridges them over. The inner surface of the ventricles is lined by a layer of endothelium known as the ependyma.

"The subarachonoid space which lies between the pia and tie arachnoid contains the cerebrospinal fluid. Its meshes communicate free-

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ly with one another. The two membranes are widely separated where they lie between the cerebellum and the medulla, and the space so formed is sometimes known as the posterior subarachnoid space or reservoir. The foramen of Magendie and the adjacent foramina of Luschka offer the only means of communication between the subarachnoid space and the interventricular system." (Bramwell, Osler's Modern Med.)

The space between the dura and the arachnoid is known as the subdural space and has no communication with the interventicular system. The space between the dura and the periosteum of the vertebræ is known as the epidural space and contains the meningorachidian plexus of veins, fat and connective tissue.

The physiology of the cerbrospinal fluid is not fully understood. Its existence was first definitely proven by Magendie in 1842. The early writers attributed various functions to it. Some held that it was associated with the pituitary membrane; others regarded it as a surface lubricant in the same way that fluid acts in serous cavities, and still others as a water bed which protects the central nervous system when the body receives jars. In the nineties Leonard Hill studied its physiology and Halliburton studied it clinically. These studies show that it is probably not a transudate but a normal secretion. The amount of cerebrospinal varies under normal conditions, being larger in the aged. It is white or colorless like water, of a slightly alkaline reaction, and the specific gravity varies from 1004 to 1010. The normal pressure in the subarachnoid space is variously estimated by different workers. It is equivalent to a column of water of 40 to 60 mm. (Quincke), 100-150 (Kroenig). The total proteid content amounts to less than 5-1 per mille. These consist of globulin, albumose and possibly a trace of serum albumin. Sodium chloride is present in relatively large quantities. It contains a reducing substance which does not undergo fermentation nor form an osazone when treated with phenylhydrazin and is probably closely related to pyrocatechin. The cell content under normal conditions amounts to 0-5 cells per c. mm.

"The fluid is probably due to the secretory activity of the ependymal cells lining the vascular choroid plexuses and the secretion is active, more or less constant and probably amounts to a half a liter in twenty-four hours, as has been shown in cases of subarachnoid rhinorrhœa. There is a constant circulation of the fluid. Forming largely in the lateral ventricles, it passes to the midventricular system through the foramen of Munroe, thence to the subarachnoid spaces through the foramina of Magendie and Luschka, and from here into the general circulation. The bulk of it passes through the dural sinuses and possibly a small portion along the meningeal sheaths of the cranial and spinal nerves. It was formerly supposed that the Pacchionian bodies had something to do with this; which is probably erroneous, as it escapes by way of the arachnodian connections with the dura in infants, in apes and in the canine, in whom there are no Pacchionian granulations. (Cushing).

THE OPERATION.

The puncture must be done under the strictest precautions to obtain thorough asepsis. Preferably, the patient should be in the horizontal position on the left side with the knees drawn up as near to the chin as possible. A general anæsthetic is usually necessary. A needle from 4-10 cm. long with a calibre of from 1-1.5 mm., provided with a stylette, should be used. The site of puncture is a little to one side of the median line between the third and fourth lumbar vertebræ. A line drawn from the highest point of one iliac crest to the other is exactly on a level with the spine of the fourth lumbar vertebræ, hence just below the spinous process next above this point is the point of election. At this point the dura is nearer and more firmly attached to the spinal column, and is not so likely to recede in front of the needle. The needle is thrust with firm,

constant pressure upward and inward through the muscles of the back and the ligamentum subflava. The absence of resistance shows that the needle has entered the canal, when, under favorable conditions, the cerbrospinal fluid will begin to flow. The distance to which the needle should penetrate is from .75 to 1.50 in. in children and 1.5 to 3 ins. in the adult. If introduced too far the meningo-rachidian veins may be wounded when the blood will vitiate the results of the puncture. Failure to obtain fluid may result from failure to enter the subarachnoid spaces by introducing the needle too far into the epidural space, by the dura receding in front of the needle, by the needle becoming plugged, hence the necessity of introducing the stylette, or the fluid may be too thick to flow through the needle or the subarachnoid space may be dry from the occlusion of the foramina of Magendie and Luschka. The fluid should not be aspirated. With proper precautions the ill effects of the operation are slight. These may be avoided by not drawing off too large amount of fluid, by having the patient avoid assuming the erect position for an hour after the puncture. Deaths have occurred especially where there is increased pressure as in cerebellar tumors due to hernia cerebelli through the foramen magnum producing pressure anæmia of the vital medullary centers. Removal of larger amounts than is necessary for diagnostic purposes would seem to be contraindicated in cases of vascular sclerosis and aneurism of the cerebral vessels in all acute and chronic affections of the nervous system without pressure symptoms arising from the cerebrospinal fluid on account of the danger of cerebral hemorrhage. I have seen no bad effects from puncture performed seventeen times.

AS AN AID TO DIAGNOSIS.

For practical purposes the following determinations may be made. (1) The pressure under which the fluid is obtained. (2) Its coloration, chromodiagnosis. (3) The protein content. (4) The cell content. (5) The cell character of the fluid, Cytodiagnosis. (6) Its bacteriology, Cryoscopy, the determination of cholin, the tonicity and the electric conductivity of the fluid being procedures of more scientific interest than practical value.

PRESSURE.

For practical purposes the pressure of the fluid may be estimated by the character of flow. Under normal conditions the fluid comes out droy by drop, being influenced by the position of the head, the cardiac pulsation and respiratory activity. A fountain spurt indicates increased pressure. The pressure may be measured in terms of the fluid by connecting a graduated tube by means of rubber tubing to the needle. Quincke considers a pressure of more than 150 mm. as indicating a pathological condition. The pressure is increased in cases of hydrocephalus, intra cranial tumors, serous, tuberculous and purulent meningitis, sometimes in uræmia and infective fevers. According to Quincke moderate increase of pressure with severe pressure symptoms points to acute, while a great rise in pressure with slight pressure symptoms indicate a chronic process.

CHROMODIAGNOSIS.

Wentworth suggests that the color of the fluid be compared with a test tube filled with clear water. The fluid may be bloody, when it will be necessary to determine whether the blood is the result of the puncture or due to pathological condition. "If the fluid is received in three different tubes, and the tint is the same in each tube, probably the blood is not due to the puncture." (Campbell.) "On centrifugalization the fluid often retains its normal color when the hemorrhage is due to the puncture, where as it retains a yellow tinge when the hemorrhage has occurred into the cerebrospinal fluid" (Mathieu). Hematoidin and hemosiderin may be demonstrated in cases of hemorrhage of long standing, and might be of value in distinguishing cerebral embolism or thrombosis from cerebral hemorrhage. The fluid is usually quite clear in hydrocephalus serous meningitis, tuberculous meningitis, and tumors of the brain. A puru-

lent fluid is absolutely diagnostic of purulent meningitis or ruptured brain abscess. A clear fluid, however, does not exclude purulent meningitis, especially is this true of cerebrospinal meningitis. I have observed a perfectly clear fluid in three cases of cerebrosphial fever. A greenish purulent fluid has been considered of diagnostic value in pneumococcic meningitis. I have also seen a clear or only slightly opalescent fluid in a case of pneumococcic meningitis. Sometimes the fluid is greenish yellow from staining with bile pigment.

CHEMICAL.

To determine the proteid content of the fluid Rous' modification of Esbach's method (A. J. M. S. vol. cxxxli. No. 4) or Brandberg's (Sahlis Daignostic Methods) method for the estimation of proteid may be used. In serious meningitis the proteid content is .5 to .75 pro mille; in tumors of the brain, traces to .8 pro mille; in tubercular meningitis, .5 to 1.75 pro mille; in purulent meningitis, 1 to 5 grms. per litre. Cholin may be demonstrated in degenerative lesions of the central nervous system, thus enabling one to distinguish between organic and functional lesions.

CYTODIAGNOSIS.

This requires the determination of the number of cells and also the differential count of these cells. The old method of estimating the number of cells per microscopic field is entirely unreliable for isolated cases. They may be accurately counted with the hæmocytometer using a weak aqueous solution of gentian violet. Rous recommends that a saturated aqueous solution of gentian violet be drawn up to the fourth decimal place on a 1 to 100 melanguer and then fill the pipette with cerebrospinal fluid. This gives 996 parts of the fluid to 1000. In a case of cerebrospinal meningitis recently observed in which the fluid was quite cloudy, I determined the number of cells to be 20,000 in the same way in which red blood cells are counted, using a weak solution of gentian violet. The differential count is made from smear preparations stained with Wright's method for blood. Formerly much importance was attached to cell formulæ, especially by the French workers. In cases of purulent meningitis and in cerebrospinal fever the number of cells is greatly increased with marked increase in the polymorphonculears. In the case referred to above the number of cells was 20,000 per c. mm. with 95 per cent polymorphonuclears. Still, in old cases of cerebrospinal meningitis, the mononuclear cells may predominate. "Very exceptionally a fluid containing no excess of cells is met with" (Bramwell). I have observed this in one case of pneumococcic and three cases of meninococcus meningitis. Lympocytosis has generally been observed in tuberculous meningitis, cerebrospinal syphilis, general paresis and occasionally in herpes zoster, chronic alcoholism, intracerebral tumor and mumps." "Except along the broadest lines there is nothing specific in the permutations of protein, pressure and cells. But along these lines the fluid from tuberculous meningitis is characteristic as compared with that from cerebrospinal syphilis, or paresis, and these also differ from the normal fluid. If a case be suspected to be one of tuberculoids meningitis but the fluid prove to be normal as regards pressure, protein and sells, the disease may be ruled out" (Rous).

BACTERIOLOGY.

The bacteriological examination of the cerebrospinal fluid includes the direct microscopical examination, cultures and animal inoculation. Usually the latter gives the diagnosis too late to be of value, especially in the cases of tuberculous meningitis. The fluid should be collected in sterile tubes and sterile blood serum tubes inoculated at the bedside. Indeed, all observations should be made on fresh fluids. Various bacteria have been found in the cerebrospinal fluid of meningitis. There are only two bacteria which give rise to epidemic cerebrospinal meningitis, the meningococcus and a streptococcus very similar to the streptococcus mucosus. In cases of sporadic meningitis many bacteria have been

found, meningococcus, pneumococcus, streptococcus, staphylococcus, gonococus, tubercle bacilli, bacillus typhosus, bacillus coli, bacillus diphtheriæ, influenza bacillus, bacillus proteus, facillus lactis ærogenes, bacillus pyogenes fœtidus, bacillus anthracis, bacillus tetragenous and leptothrix. As stated above the presence of clear fluid does not exclude the presence of bacteria.

For practical purposes the direct examination will establish the diagnosis. The fluid is centrifuged and smears made from the precipitate and subjected to various staining methods. A gram negative diplococcus phagocytized or free in fluids of low cell content is sufficient to identify the meningococcus. The only other organism with which it is likely to be confused is the gonococcus which may be distinguished by its failure to grow on blood serum. The staphylococcus, streptococcus and pneumococcus may be identified by their morphology and positive reaction to Gram's method of staining.

The finding of the tubercle bacillus will depend largely upon the technique and patience with which they are searched for. The frequency with which they are found is variously estimated from 50 per cent to all cases. It is said that it is preferable to allow the fluid to clot spontaneously to centrifugalizing the fluid.

AS A THERAPEUTIC AGENT.

Spinal puncture as a therapeutic agent is used to fulfill two indications, (1) to relieve increased intracerebral pressure (2) to introduce medicaments into the cerebrospinal canal. Until recently the latter has been attended with no noteworthy results. The injection of antimeningococcic serum into the spinal canal in the treatment of cerebrospinal fever marks another successful achievement in therapeutics. The mortality of the disease has been reduced at least one-half by the use of the Flexner serum.

In my own practice I recall twelve cases of this disease. Nine of these were seen before the serum was prepared. Seven of these died. The last three cases were given the serum and two of them died. The first one was a little girl five years old, seen in the fourth week of the disease, when signs of hydrocephalus were distinct. The second was a boy seven years of age, who was injected with 15cc. on the fourth day of the disease and 25cc. on the fifth day, after which he made a rapid recovery. The last was a young man twenty-one years of age who was injected with 30cc. on the fourth day of the disease, 60cc. on the fifth, and 30cc. on the sixth day. On this day he died.

Koplik has pretty well defined the indication for lumbar puncture in cerebrospinal meningitis, viz., to relieve the delicate brain tissue of the effects of the excessive pressure of an infected fluid, i. e., in those cases in which hydrocephalus occurs. It is the association of this condition in other forms of meningitis which renders puncture of value, as in serous meningitis in the course of typhoid fever and other infective fevers, and tuberculous meningitis. It therefore becomes necessary to recognize the distention of the ventricles at the earliest possible moment. Much good will be accomplished by recognizing this condition before the terminal symptoms placard it. Headache, vomiting, stasis pupillæ and McEwin's sign, a tympanitic note on percussion over the pterion with the patient in sitting posture, these symptoms and the latter sign especially, whether in serous meningitis, tubercular meningitis, cerebrospinal meningitis, or hydrocephalus, are an absolute indication for lumbar puncture.

Lumbar puncture has been used in numerous other conditions with reported success—in the pains of herpes, zoster, headache secondary to cerebral syphilis, uræmia and lead poisoning, and in the lightning pains of tabes dorsalis. It is recently receiving much attention in the treatment of various ear affections.

Porter Building.

THE USE AND ABUSE OF ATROPINE IN EYE DISEASES*

By F. P. HOOVER, M.D.,
Jacksonville, Fla.

The use of atropine in the eyes is so common it is not my purpose to go into detail regarding the diseases principally for which it is used, but more especially that class of cases in which atropine is contraindicated. The specialist really more appreciates the importance of where and when not to use the drug, but to those who are not so familiar with eye affections the following may be of some interest. In the first place let me say atropine is without doubt the most valuable agent in opthalmic practice; the indiscriminate use of same in all kinds of eye troubles frequently causes great discomfort to the patient and some times is productive of more serious consequences. The two conditions resulting from atropine when not judiciously used, is first, inflammation of the eye, viz.: of the conjunctiva, lids and sometimes extending to the entire side of the face and neck; second, Glaucoma. I have heard of dislocation of the lens resulting from use of atropine, but I have personally never seen same. Eye inflammation from use of atropine is frequently mistaken for a case of simple conjunctivitis and not easy to differentiate, of course, when the use of atropine is discontinued the inflammation will gradually subside of itself. Old people are more subject to the toxic effect of the drug, although I have seen it in all ages; there is dryness of the mouth, an eruption on the face, possibly delirium, elevation of temperature, appearing like a marked case of scarlet fever. The conditions may appear sometimes after a brief use of the drug, even a few drops of a weak solution, but usually after quite an extended employment of it. I have found in my experience the inflammation from atropine simulates the catarrhal conjunctivitis. It, however, sometimes is of a purulent nature. I tabulate cases where atropine has been used unjustly, "Abusive Atropine Conjunctivitis." The symptoms when you first see the patient are, eyelids swollen, may be an exudation from them of a pus or muco-pus consistency, eyelashes matted and crusts on them, lids hot and red, face around eyes red and somewhat streaked. The best treatment is to stop atropine and use such washes as boric acid or salt solution; the eye will take care of itself if no underlying trouble exists. Glaucoma, the other condition produced by atropine, is the result of instilling the drug in the eyes of patients over forty (40) years of age; be careful to look for hypermetropia, as this condition of the eye is more often attacked, in fact any kind of eye is liable to attack, but the age of the patient is a great factor to be reckoned with. Atropine is usually used in the eyes from one to two grains to the ounce solution. It should be applied to the inner surface of the lower lid. Atropine is used for refractive purposes, but then only by the specialist. A good rule to observe regarding the use of atropine is, never use it in the eye at all unless you are fully aware of what you are doing; never use it in the eye of a patient forty years old or over, or where there is hypermetropia; where there is a shallow anterior chamber; gouty or rheumatic diathesis; sluggish pupil or increased tension of the eyeball. On the other hand, the sheet anchor in the treatment of iritis and kerititis is atropine. In the former it should be used from the very beginning, the quicker the iris is gotten under the influence of the mydriatic, and particularly if of the plastic variety, the better, it breaks down adhesions by dilating the iris and relieves pain. In kerititis it acts by paralyzing the muscles of accommodation, relieving the cornea from any action the ciliary muscles may have indirectly on it, and also by its anæsthetic effect. In cyclitis and inflammation of the retina, hyalitis and choroiditic. To illustrate above I herewith report two very interesting cases recently in my practice. Case 1—Ella B., age 13 years;

left eye swollen and red, tears flowing down cheek; in corners of eye crust formations; considerable pain and some intolerance to light. The mother said her child took cold and it settled in her eyes; a neighbor gave her some drops a doctor had once ordered for her when she had sore eyes; these drops were used for two days prior to coming to see me. On examination I found the pupil of left eye widely dilated, the right pupil also larger than normal, conjunctivitis of both eyes, but the left eye was the one she suffered with; the patient hot and feverish. I washed eyes with a saline solution and applied tanin and glycerine to lids; ordered boric acid wash for home use, gave calomel purge at night and broken doses of quinine, and to stop the drops she had been using. I saw her every day for ten days, the inflammation and pain was entirely gone, the left pupil was still slightly enlarged; four days later, and last visit paid by me, both pupils normal and all eye discomfort gone. This no doubt was atropine conjunctivitis caused by an overkind friends prescribing for the child.

Case 2—J. H. B., male, age 44 years. Northern tourist, had all symptoms of case 1, only in addition there was an eczema covering the eye extending down side of face to chin, there were cracked and bleeding places on the face, but as he had just been shaved, the razor might have been partly responsible for the bleeding; the pain was intense in left eye. He said he had some eye trouble a few months before and presuming present condition was a relapse of the former, he used some drops and wash that had then been given him. The swelling, after using the medicine, drops, etc., gradually increased until he became frightened and had the porter on train to get him some ice, which he kept constantly to eye until arriving here, when he was referred to me. I stopped all his medicine and treated inflammation and eczema on general principles. Two weeks later eczema cured, pain, redness and swelling disappeared, but there was a slight dimness of vision of left eye not there before. On fifteenth day after first visit patient continues his trip down the East Coast, and I have not since heard from him.

18-19 *Mutual Life Building.*

CALCULUS IMPACTED IN LEFT URETER; REMOVED THROUGH AUTHOR'S OPERATIVE CYTOSCOPE.

CASE REPORT.

By DR. BRANSFORD LEWIS,
St. Louis, Mo.

Dr. W. L. Goddard, Saulsbury, Tenn., practicing physician; sixty years of age. First conference, October 29, 1908; referred by Dr. E. M. Holder, Memphis, Tenn.

The patient said that he had first noted the urinary disturbance about twelve years ago, when he had had severe colic in the left renal region, lasting several hours, and requiring the use of morphine hypodermically for its relief. Since then he has had a number of similar attacks. One small stone was passed and observed by him, about one year and a half ago. During the past nine months the patient has felt severe pain in the region of the left ureter, low down, never having been free from it at any time during that period, except when asleep.

Examination: Both urines clear and free from pus or blood. Cystoscopy easy. Right ureteral orifice normal. Left orifice showed a small black plug embraced in its lumen, and emerging slightly—plainly visible through the observation (universal) cystoscope. It was shown to and clearly seen by several physicians, including Doctors Hopkins, Burford and Lund, who were in the office at the time. After that the universal cystoscope was withdrawn and was replaced with the operative

cystoscope, through which a ureteral alligator forceps was passed and inserted into the affected ureteral opening. It was stretched widely within the orifice, and immediately the little plug popped out into the bladder, followed by a spurt of yellow, purulent urine, plainly visible to the eye. The plug was later removed from the bladder, and proved to be a spiculated uric acid calculus about the size of a grain of wheat. The retention of the stone in the ureter seems to be explainable on the ground of the little pointed spicule that projects from one side of it and was probably buried in the wall of the ureter.

It is interesting to relate, that immediately the stone jumped out of the orifice, the patient remarked, "That is the first time in nine months that I have been free from that pain." The pain did not recur afterwards.

For the sake of confirmation, the patient was retained for two days; after which time the left ureter was catheterized, the catheter passing easily to the kidney pelvis and draining clear, healthy urine therefrom. He then went home.

Century Building.

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HEADACHE AND THE ERRORS IN ITS TREATMENT.

Intermittent headaches, as commonly presenting themselves for relief without organic or specific lesions in the brain, belong practically to two classes, the large majority of which are toxic. The almost constant history of constipation in women, with the auto-intoxication which of necessity follows, is the most common form of toxic headache; this is especially true before forty years of age, whereas, after that period the lithemias and uric acid cases are more prominently brought to our notice. Of course these cases must be treated on the eliminative and not symptomatic, but I desire to call especial attention to two conditions, one of which is overlooked very frequently as a cause, the other being the injurious effects of symptomatic treatment by the coal tar preparations which have made for themselves a very large and injurious place in the management of headaches. Headaches occurring in children after beginning school, and those occurring in young adult life, are so frequently produced by astigmatism or some defect in the muscular mechanism controlling the accommodation that it is the duty of every practitioner to have the eyes examined by some competent oculist in all cases of headache in the young, or where it persists after proper elimination, and where hereditary tendencies and where chronic organic brain lesions can be eliminated. It is remarkable how much suffering and what a multiplicity of nervous phenomena can be produced by even slight errors of vision, and believing it to be bad practice to treat any form of headache without having first sought for and found the cause, I desire to emphasize the great importance of eye examinations in these cases. Believing that the majority of the ordinary headaches in children and young adult life will be found to have these eye defects.

The second point I desire to emphasize is the almost universal custom of the profession to treat these cases symptomatic and in this way the laity have become drug habitues and commercial manufacturers, taking advantage of this practice, do not hesitate to place on the market all kinds of combinations of hurtful remedies, many of which are heart depressants, and some of which will have permanent weakness, not to mention many drug habitues who started either by the prescription of some thoughtless doctor or druggist giving them these so-called headache remedies.

The time has come when the profession must study such cases closely until the actual cause is found, and the entire profession must take a positive stand against these preparations which are known to be hurtful in their constant use. It is for this purpose that this time warning is sounded. J. A. W.

KING EDWARDS' LAST ILLNESS.

The following abstract of the signed statement of the history of the King's illness is summarized from the London Lancet of May 14, 1910:

The late King Edward VII of Great Britain, who died in London on May 6th, had, for

some years, suffered from emphysema and bronchial catarrh, the base of his lungs giving permanent signs of these maladies.

His Majesty seems to have lacked that vigor of constitution which stood him in such stead in 1902, when he underwent a most serious operation, and occasional digestive disturbances gave his physicians some concern.

The King manifested much anxiety at the strained position of British politics which has disturbed the empire during recent months, and it was in search of leisure from these vexations that His Majesty visited Barritz. Some months previous to his journey thither, he received vaccination treatment which his physicians hoped would temporarily secure him from catarrhal attacks.

At Paris his travel was broken, and during his first night there he suffered from a severe attack of acute indigestion, followed by dyspnœa and cardiac distress. He, however, exchanged visits with the President of France the following day, and fulfilled ordinary social engagements.

It became clear, on his arrival in Barritz, that the King had contracted a chill, which developed into bronchial attack, lasting some ten days, confining him to his bed most of the time. His physician became solicitous, but the symptoms soon disappeared, and King Edward passed the remaining days of his visit in quiet pleasure.

On returning to England, April 27th, he was improved in every way, and resumed his usual life. On April 30th he visited Sandringham, feeling a little unwell, and the day following contracted a chill while inspecting some new planting and garden alterations. He returned to London May 2d feeling out of sorts. That evening, on his return from a social dinner, his physician saw him and found him complaining of dyspnœa, with a raised temperature and accelerated pulse and respiration. Distinct bronchial crepitations were present over the base of both lungs. The following morning, May 3d, the symptoms were abated, and he felt improved. Despite the insistence of his physicians that he remain quiet, the King gave several audiences. At 7 p. m. he complained of feeling ill, and during the night suffered from several attacks of dyspnœa. The next morning found him complaining of his throat, and a throat specialist, St. Clair Thompson, who had seen him before, was called in. An examination of the throat revealed a catarrhal condition which had extended to other organs. Again he gave several important audiences.

At 6:15 P. M. his three physicians held a consultation, and it was found that the two consecutive bad nights had told upon His Majesty. There was imperfect entry of air at both bases and much fine bronchial crepitation; the right heart was embarrassed; temperature normal, respiration 34.

The day following, May 5th, found the King unimproved, but he again gave audiences. Attacks of dyspnœa were more frequent and severe, and increasing cyanosis gave rise to apprehension of cardiac failure.

In the afternoon the Queen arrived from the continent, and the failure of the King to meet her at the station gave the public its first intimation of his illness. The first bulletin was now issued by the physicians, Sir Francis H. Lakin, Sir James Reid and Dr. R. Douglas Powell.

Up to an early hour Friday morning King Edward enjoyed a better night, but later in the morning the symptoms became alarming.

He grew rapidly worse, and at 3 P. M. consciousness began to fail, and the end came at 11:45 P. M. after a period of calm.

W. D. H.

A BILL TO LENGTHEN LIFE.

It is interesting to see the universal interest that health matters are now provoking. It speaks well for the profession that the medical fraternity have finally improved upon the views of the law makers, and the public writers of the day.

As one of the most pleasing expressions in reference to the new bill, establishing a Department of Health, the following quotation from "Harper's Weekly" is one of the most convincing and irrefutable commendations which we have seen.

Surely, if a layman takes this strong position, it behooves every single medical man to exercise his utmost influence in obtaining pledges from his individual Congressman to support this all important measure.

It has been attacked by the patent medicine interests in a most misleading and cowardly way. The American Medical Association, for instance, which is only one of the many national bodies representing different phases in the study and propaganda for the uplifting of humanity, is branded as a trust. As Gov. Hadley, of Missouri, said in his address of welcome to the American Medical Association in St. Louis recently, "if this be a trust, give us more of them."

Unfortunately the lay press, which is largely dominated by patent medicine influence, on account of the enormous advertising which it gives newspapers, are all too easily influenced in the publication of sinister and misleading articles about the purposes and alleged results of this bill.

Every doctor and humanitarian who reads the straightforward, unvarnished recital of facts laid down in the appended article, should at once write to his Congressman, and forcefully put his views before the representative. By so doing our law makers will be made to realize the truths and wisdom of this measure. A disinterested opinion from a representative practitioner, who is known personally to his Congressman, will have more weight than all the lobbyists can possibly exert.

Write to your Congressman today!

At least fifteen years may be added in one generation to the average of human life throughout the country by the application of science to the prevention of disease, and the first step toward this consummation will be the enactment into law of the bill establishing a national department of public health that has been introduced in Congress by Senator Robert L. Owen, of Oklahoma. This measure is supported by the American Association for the Advancement of Science, the Academy of Medicine, the American Medical Association, the Committee of One Hundred of the Amreican Federation of Labor, the National Grange, and various health bodies of the forty-six States. According to statistics 600,000 people die annually in this country from preventable causes, and 3,000,000 are disabled and thrown out of employment during variable periods of every year from sickness, the annual economic loss from this source amounting to more than $1,500,000,000. Senator Owen points out that, of the national pension roll of more than $150,000,000 per annum, three-quarters is due to illness and death from diseases that were preventable, and that the United States would now be saving an annual charge of $100,000,000 in pensions, and might have already saved $2,000,000,000 in that respect, had we been given the benefits of the administration of a Department of Public Health in the past. The Senator declares that the commercial value of the possible saving in life and efficiency in the country is easily $3,000,000,000.

Senator Owen's bill provides that all

national departments and bureaus belonging to any department affecting the medical, surgical, biological, or sanitary service, except the departments of War and the Navy, shall be combined in one department to be known as the Department of Public Health, which shall be under the supervision of a Secretary of Public Health, to be appointed by the President, a Cabinet officer, by and with the consent of the Senate, with the same tenure of office as the other members of the Cabinet. Under the provisions of this bill there will be included in the scope of the new department the Bureau of Public Health and Marine Hospital Service; the medical officers of the Revenue-Cutter Service; the medical officers, surgeons and examiners of the Pension Office; all physicians and medical officers in the service of the Indian Bureau or the Department of the Interior at old soldiers' homes, at the Government Hospital for the Insane, and the Freedman's Hospital, and other hospitals of the United States; the Bureau of Entomology; the Bureau of Chemistry and Animal Industry of the Department of Agriculture; the hospitals of the Immigration Bureau of the Department of Commerce and Labor; the emergency relief bureau in the Government Printing Office; as well as every other government agency for the protection of the health of the people, or of animal life.

The health bureaus of the Army and Navy departments are not included in the proposed health department for reasons of expediency, Senator Owen apprehending political opposition from these sources. "It would probably be impossible to pass a bill in face of the opposition of those who are connected with the medical service of the Army and Navy," he says, "and, moreover, the bureaus of health in those departments, being particularly dependent upon the military arm of the government, may be excluded from a department of public health, although I do not think they ought to be. When the proposed department is once established, however, and it sets a standard of sanitary science in relation to public health, it will exercise a cogent influence over the practice of all departments affecting the public health, including those having in charge the physical welfare of our soldiers and sailors."

The Committee of One Hundred sets forth the following reasons why this country should have a national department of public health: to stop the spread of typhoid fever through the drinking of sewerage-polluted water of interstate streams; to enforce adequate quarantine regulations, so as to keep out of the country plague and other similar pestilences; to supervise interstate common carriers, in so far as without such supervision they prove a menace to the health of the traveling public; to maintain a central organization of such dignity and importance that departments of health of other states and cities will seek its co-operation; to influence health authorities, state and municipal, to enact uniform legislation in relation to health matters; to act as a clearing-house of state and local health regulations and to codify such regulations; to draw up a model scheme of sanitary legislation for the assistance of state and municipal health officers; to gather accurate data on all questions of sanitation throughout the United States; to reduce the death-rate.

To reduce the death-rate is, of course, the ultimate purpose of all the preliminary efforts of the proposed national department of public health, and Professor Irving Fisher's report on "National Vitality," made to the National Conservation Commission, contains the most recent discoveries of scientific and medical men tending to that end. According to the report, money estimates of waste of life are necessarily imperfect and sometimes misleading; the real wastage may most fittingly be expressed in terms of human misery. Poverty and disease are twin evils, and each plays into the hands of the other, for from each springs vice and crime, and whatever diminishes poverty tends to improve health. The conservation of our natural resources—land, raw materials, forests and water—will provide the food, clothing, shelter and other means of maintaining healthy life, while the conservation of health tends to conserve and increase wealth.

Professor Fisher's researches emphasize the variability of mortality in different parts of the world. Recent statistics for India show that the average duration of life there is less than twenty-five years; in Sweden it is over fifty years; in Massa-

chusetts forty-five years. The length of life is increasing wherever sanitary science and preventive medicine are applied. In India it is stationary; in Europe it has doubled in three and a half centuries. The rate of increase in Europe during the seventeenth and eighteenth centuries was about four years a century; during the first half of the nineteenth century, about nine years per century; during the latter half of the nineteenth century, about seventeen years per century; while in Germany, where medical and sanitary science has reached its highest development, it was about twenty-seven years per century. The only comparative statistics available in this country are for Massachusetts, where life is lengthening at the rate of about fourteen years per century, or at half the rate of Germany.

"There is no need, however, of waiting a century for this increase," says Professor Fisher. "It could be obtained within a generation. Three-fourths of the mortality from tuberculosis, of which 150,000 Americans die annually, could be avoided. Eighteen experts in various diseases, as well as vital statisticians, have contributed data on the ratio of preventability of the ninety different causes of death into which mortality may be classified. From these data it is found that fifteen years at least could be at once added to the average human lifetime by applying the science of preventing disease. More than half of this additional life would come from the prevention of tuberculosis, typhoid and five other diseases, the prevention of which could be accomplished by purer air, water and milk. The lengthening and strengthening of life can be secured through medical investigation and practice, school and factory hygiene, restriction of labor of women and children, the education of the public in both public and private hygiene, and through improving the efficiency of our municipal, state and national health service. Our national government has now several bureaus exercising health functions, which only need to be concentrated under one department to become co-ordinated parts of a great health service worthy of the nation."

In ironic comment on present conditions Mr. Owen said in the Senate the other day: "I recently sent 250,000 bulletins to farmers in Oklahoma on how to raise swine. I had no bulletins to send out on how to protect the health of children."

W. H. D.

BOOKS RECEIVED

An Index of Symptoms with Diagnostic Methods. By Ralph Winnington Leftwich, M.D., late Assistant Physician to the East London Children's Hospital. Fourth edition. Price, $2.25, net. William Wood & Co., New York City.

Surgical After-Treatment. By L. R. G. Crandon, A.M., M.D., Assistant in Surgery at Harvard Medical School. Octavo of 803 pages, with 265 original illustrations. Philadelphia and London, W. B. Saunders Company, 1910. Cloth, $6.00, net; Half Morocco, $7.50, net.

Diseases of the Eye. A handbook of Ophthalmic Practice for Students and Practitioners. By G. E. DeSchweinitz, A.M., M.D., with 351 illustrations and seven chromo-lithographic plates. Sixth edition. Thoroughly revised. Price, cloth, $5.00, net. W. B. Saunders Company, Philadelphia and London.

Medical Electricity and Rontgen Rays. By Sinclair Tousey, A.M., M.D., Consulting Surgeon to St. Bartholomew's Clinic, New York City. Octavo of 1116 pages, with 750 illustrations, 16 in colors. Philadelphia and London, W. B. Saunders Company, 1910. Cloth, $7.00, net; Half Morocco, $8.50, net.

The Pathology of the Living and Other Essays. By B. G. A. Moynihan, M.S. (London), F.R.C. S., Honorary Surgeon to Leeds General Infirmary; Professor of Clinical Surgery at the University of Leeds, England. 12mo. of 260 pages. Philadelphia and London, W. B. Saunders Company, 1910. Cloth, $2 00, net.

Pulmonary Tuberculosis and Its Complications. By Sherman G. Bonney, M.D., Professor of Medicine, Denver. Octavo of 955 pages, with 243 original illustrations, including 31 in colors and 73 X-Ray photographs. Philadelphia and London, W. B. Saunders Company, 1910. Cloth, $7.00, net; Half Morocco, $8.50, net.

A Text-Book of Pathology. By Joseph McFarland, M.D., Professor of Pathology and Bacteriology in the Medico-Chirurgical College of Philadelphia. Second edition. Octavo of 856 pages, with 437 illustrations, some in colors. Philadelphia and London, W. B. Saunders Company, 1910. Cloth, $5.00, net; Half Morocco, $6.50, net.

Duodenal Ulcer. By B. G. A. Moynihan, M.S. (London), F.R.C.S., Senior Assistant Surgeon at Leeds General Infirmary, England. Octavo of 379 pages, illustrated. Philadelphia and London, W. B. Saunders Company, 1910. Cloth, $4.00, net; Half Morocco, $5.50, net.

Prescription Writing and Formulary. By John M. Swan, M.D., Associate Professor of Clinical Medicine, Medico-Chirurgical College of Philadelphia. 32mo. of 185 pages. Philadelphia and London, W. B. Saunders Company, 1910. Flexible leather, $1.25, net.

Manual of Tropical Medicine. By Aldo Castellani, M.D. (Florence); Privat Docent (Naples), and Albert J. Chalmers, M.D. (Vic. and Liv.); F.R.C.S. (Eng.); D. P. H. (Can.), over 1200 pages with 373 illustrations and 15 colored plates. Price, $6.00, net. William Wood & Company, New York City.

BOOK REVIEWS

Animal Experimentation. By James Peter Warbasse, M.D., Surgeon to the German Hospital, New York. Published by D. Appleton & Co., New York and London. Pages 170.

This small volume on "The Conquest of Disease Through Animal Experimentation," is well worth the short time it takes to read it. It gives one a clear cut idea of the marked progress, and the way it has been accom-

plished, that has been made along prophylaxis as well as treatment of different diseases. He also deals with the humane manner in which experimenters carry on their work. It would do the anti-vivisectionists much good to read and study this small volume in order that they may see what hazardous diseases have been practically eradicated by these bold and fearless workers along the line of animal experiments. There is no new information in this volume to the well informed physician, but it is full of facts that should be known to the laity, therefore it would be well for physicians to recommend it to the laymen.

O. N. B.

Diseases of the Eye. A handbook of opthalmic practice for students and practitioners. By G. E. DeSchweinitz, A.M., M.D., with 351 illustrations and seven chromo-lithographic plates. Sixth edition. Thoroughly revised. Price, cloth, $5.00, net. W. B. Saunders Company, Philadelphia and London.

A new edition of Dr. DeSchweinitz' work on the eye will be received with pleasure by the profession in general and opthamologists in particular. The sixth edition of this book is completely revised and contains much new matter. Subjects treated for the first time are: The use of the Astigmatic Lens, or Crossed Cylinder; Cyanosis of the Retina; Posterior Scleritis; Obstetric Injuries of the Cornea; Ocular Complications of Nasal Accessory Sinus Disease; Intermittent Exophthalmus; Kuhnt-Szymanowski's Operation for Ectropion; Galvanopuncture for Ectropion and Entropion; Establishment of a Filtering Cicatrix; Combined Iridectomy and Schlerotomy; Precorneal Iridotomy; Smith's Operation for Removal of Cataract in Capsule; Operation for Prosthesis in Cicatrized Orbit.

Many other portions of the book have been rewritten and the whole brought up to date. The chapter on the shadow test is written by Dr. Edward Jackson of Denver, the well known authority on Retinoscopy. A number of new illustrations have been added.

The general practitioner, as well as the specialist, will find this work a very complete treatise upon the diseases of the eye.

It is attractively bound in green cloth and the paper and presswork are excellent.

M. M. C.

The Optic Nerve and Accessory Sinuses of the Nose. A contribution to the study of canalicular neuritis and atrophy of the optic nerve of nasal origin. By Prof. A. Onodi (University Budapest). Authorized translation by J. Luchoff, M.D. Edin.; Ch. B., Capetown. With fifty illustrations. New York, Wm. Wood & Co. MDCCCCX. Net, $3.50.

A beautiful book upon a most interesting subject, is the work of Professor A. Onodi, on "The Optic Nerve and the Accessory Sinuses of the Nose." The causal relation between eye disease and inflammation of the accessory sinuses of the nose has attracted world-wide attention for the past few years. Since ophthalmatogists began calling attention to it a great many cases have been reported which seemed to show a direct relationship. Our knowledge of the anatomic relationship of the optic nerve and the sinuses involved has been somewhat hazy and the work of Professor Onodi on this difficult subject will be particularly appreciated. There are fifty illustrations of anatomical sections through the orbit and sinuses, and it is impossible to speak too highly of the beauty and clearness of the cuts. The sections are life size and the thoroughness with which the minute anatomy is shown well illustrate the mental attitude which the German scientist holds toward his work. The American desire to get results interferes sadly with the progress of the scientific spirit on this side, and we would do well to consider the foreign point of view, while they might learn something from us in the matter of finished technique and consideration for the welfare of the patient.

One-third of the book is devoted to the clinical consideration of the subject, and a very comprehensive review is given of the literature. M. M. C.

An Index of Symptoms. By R. W. Leftwich, M.D., London. Fourth edition. Published by Wm. Wood & Co., 1910. Pages 451.

This little volume fills a notable deficiency in medical literature, and is equally valuable to all, whether specialist or general practitioner, who may be called upon to make a diagnosis. Symptoms—and the list is very complete—form the headings, under each of which are mentioned the diseases that might cause the same. Thus, the arrangement follows the same order as the mind of the physician at the bedside. Other information is given to assist in a differential diagnosis. The chapter on Methods and Fallacies in Diagnosis is a very helpful introduction.

R. W. B.

ABSTRACTS OF CURRENT LITERATURE

POSTOPERATIVE TETANUS.

R. Peterson, Ann Arbor, Mich. (*Journal A. M. A.*, January 8), says that, while surgical complications such as were formerly common are becoming rarer and rarer, they still occur in the experience of any one who operates long enough and often enough. He reports a case of tetanus occurring in his own practice twelve days after an operation for shortening of the round ligament. Recovery followed the use of the antitetanic serum. The only change in the ordinary surgical technic of the hospital in this case was the use of a different kind of catgut, which, however, had been thoroughly tested in the bacteriologic laboratory and had been used in quite a number of cases with most satisfactory results. At first sight it seemed reasonable to say that it could not have been the catgut, but Kuhn has shown the fallacy of such arguments. He asserts that the catgut is made from the intestines of sheep which exist under different conditions and vary much in health. Every suture contains fibers from four or five different animals, and it has been experimentally shown that it is most difficult for a sterilizing fluid to reach every portion of a catgut strand. The material should be taken from the animals in perfect health and prepared under the most hygienic conditions and the elementary threads tested for tetanus bacillus before it is made up into sutures. Even boiling may be ineffective in destroying the existing spores. Recently Richardson has reported two cases of tetanus following operation, and collected twenty-one, with eighteen deaths, the great majority having occurred within the last three or four years. Peterson does not put faith in Richardson's theory that the post-operative tetanus is due to germs in the patient's organism. He has collected from the literature 150 cases of tetanus following operations, mainly gynecologic. A few operations like appendicitis, splenectomy, nephrotomy and hernia are included, but he would have had a much larger number if he had covered the whole range of surgery. He also tabulates cases in which the tetanus bacillus was sought for. In a number of cases it was not found, as in his own case. He has worked up the literature very thoroughly since 1899, not only as regards the particulars mentioned, but as to the results of antitoxin treatment. The cases are analyzed as to the nature of the operation and its relation to the complication. The treatment is also summarized. The author's conclusions are substantially as follows: While postoperative tetanus is infrequent, it does occasionally follow gynecologic operations and is most frequently a complication of those involving the peritoneal cavity. The infection is probably introduced at the time of operation. It has

been proved that tetanus bacilli and their spores are very difficult to kill, sometimes surviving sixty minutes boiling. Absorbable ligatures, like catgut, may carry the infection unless most thorough sterilization is employed. The process of the manufacture of catgut renders it particularly liable to this infection. The initial symptoms of postoperative tetanus appear within ten days in from two-thirds to four-fifths of the cases. The onset of symptoms in the remaining cases varies from the eleventh to the twenty-second day after operation. In his 150 tabulated cases the symptoms did not appear in any the first two days after operation, and the average incubation period was about eight days. The shorter the incubation period the more virulent and active the disease, and, whenever possible, the point of entrance of the tetanus bacillus should be ascertained and proper disinfection and drainage be instituted. This is often difficult after operations. Antitetanic serum acts on the free toxins in the blood, but has no effect on the toxins after they become fixed in the nerve cells. A study of the tables shows that the mortality of tetanus has been reduced nearly 10 per cent through the use of the serum. The best effects will be seen when its administration is begun on the first appearance of the symptoms. Chloretone can control the muscular spasms of tetanus and relieve the rigidity. It is harmless and does not prevent elimination. In tetanus elimination, thorough free catharsis and the administration of salt solutions is of the utmost importance. An extensive bibliography is appended.

THE SURGERY OF THE SPLEEN.

From our inability to recognize diseased conditions in their early stages, says W. J. Mayo, Rochester, Minn. (*Journal A. M. A.*, January 1), the surgery of the spleen has necessarily been of a destructive character. Recent investigations lead to the surmise that many of the anemias and associated blood states may ultimately be best treated by operative procedure on the spleen and other blood-forming organs. He describes the anatomy and known functions of the spleen, before birth and during life, and says that its protected situation overlain by the other important organs makes it exceedingly difficult to ascertain moderate enlargements. He questions our ability to mark out accurately any modern enlargements by percussion, but he believes that surgeons can do a great deal to increase our understanding of conditions by routine examinations of the organ during abdominal operations when an altered blood state exists. He puts the classification of splenic enlargements into three classes: First, leuckemias in which the spleen produces white corpuscles of the ancestral type, a probable reversion to the fetal form of blood. Second, splenic anemia with a diminution and change of character of the red blood corpuscles which are pathologically destroyed to some extent. Third, splenomegaly, an enlargement without blood changes and only mechanically affecting the general health. In addition to these classes there are two conservative types of enlargement of the spleen. One, the compensatory splenic hypertrophy, and second, the enlargements after infectious diseases. Unless the spleen is more or less movable its surgical approach is difficult. The Mayos have usually used an incision through the left semilunar line carrying, if necessary, the upper end along the costal margin to the ensiform cartilage. He has not found Myer's procedure of cutting the costal cartilages necessary as yet, but in some cases a left transversal incision joining the longitudinal is convenient. In advanced disease, adhesions, especially to the diaphragm, are occasionally difficult to separate until after the splenic pedicle has been secured. To grasp this vascular pedicle temporarily in rubber-covered elastic clamps is the most important step in the operation if the vessels are fairly sound. This must be very carefully done on account of the delicacy of the splenic vein. To grasp the pedicle securely the organ should be turned over, at least enough to grasp the vessels in the hand. With the fingers and blunt dissection, a passage way is made around the pedicle and a clamp ap-

plied and tightened enough to control the circulation until the spleen can be entirely separated and delivered outside the wound. If extirpation is the object of the operation the pedicle can be secured at any time after the application of the elastic clamp which is applied as close to the root as possible so as to leave distal to it, ample space for ligation. If partial resection is to be done, temporary compression of the pedicle seems harmless if there are no gross vessel-wall changes, and after the use of the clamp the desired amount can be resected and the hemorrhage controlled by buttonhole catgut suturing with a round needle, as in liver resection. "It has been shown experimentally that reduction of the artificial supply by ligation results in atrophy of the spleen, and so long as the veins are left intact, necrosis does not occur. If the splenic artery divides in the hilum, ligation of branches would appear to be an active competitor of partial splenectomy. We have not found the marked alterations in the walls of the blood vessels which have been shown to be often present at post-mortem, and which probably represent a terminal condition." Mayo analyzes his experience with thirteen cases, three conservative operations and ten splenectomies. Brief histories of all these cases are given. The article is illustrated.

THRORACIC SURGERY.

P. L. Friedrich, Marburg, Germany (*Journal A. M. A.*, December 11), classes the surgical intervention in lung affections under four heads. First, intrapulmonary interference with the diseased foci, which he says is almost invariably operated on by simple intercostal incision. He does not give the details which were given last year before the American Medical Association by Sauerbruch and others of the positive and negative pressure methods but assumes that they are sufficiently known. The intercostal incision, he says, is sufficient, as a rule, even for extensive foci of disease or injury. The resection of one or two ribs is almost exclusively reserved in his practice for cases of gangrene or abscess. As regards tumors of the lungs, his experience is not as yet sufficient for the outlining of a general technic, but we know, however, that large segments of a lobe or even an entire lobe may be removed if necessary. The diseased segment is clamped off and then excised well in the healthy tissue and the problem is rather as regards closure of the bronchi than the suppression of hemorrhage, as it is astonishing how easily hemorrhage is controlled in the lung. He has shown the point in the bronchi where lung amputation must stop, before the German surgical congress in 1907. The value of the X-ray in the diagnosis of operable diseases of the lung is generally known. He leaves the question of operating in two stages or not still open for the present. The second method of interference, namely compression of the lungs through the pleura, is more briefly discussed, and concerning its actual value and limits of usefulness, he thinks that it has been found in a large number of cases to be beneficial. In his practice pleural empyema is treated by puncture with a thick trocar followed by immediate institution of drainage, according to Thiersch. A large fenestrated Nelaton catheter is passed through the sheath of the trocar, a rubber membrane with a small orifice is slipped over it and tied fast to the tube where it emerges, thus providing air-tight closure of the thoracic cavity at the site of puncture or incision. Many empyemas, practically all the metapneumonic cases, are completely healed by this without further surgery, though the resection of one or two ribs may be performed at any time after the pus focus has become encapsulated. Third, in the disease of the lungs, he mentions his thoracoplastic operation. He insists here, as elsewhere, that only selected cases with unilateral cavernous lesions should be taken and they should be free from tuberculous lesions in other parts of the body. Certain recent cases have encouraged him, however, to extend the procedure also to conditions of slowly infiltrating non-cavernous phthisis. The arrest of respiration is in itself capable of creating relatively favorable conditions for the cure of this type also. He has

recently extended the method to eliminate an existing tuberculosis of the larynx by tracheotomy, but is unable definitely to express an opinion of the merits of the operation. Fourth, the operative treatment of diseases of the thoracic wall is discussed, and Friedrich says that tumors of the chest wall may be dealt with at the present day with a certain intrepidity, and he is inclined to think that the differential pressure method will here score some of its triumphs. The surgery of the heart has also been enriched of late by important contributions and here also the differential pressure method comes into play. He thinks that the recent experiences of cardiac and mediastinal surgery "may be summarized to the effect that by acting promptly, under strict asepsis, after a sharply outlined anatomic plan, we may, with the aid of modern technical devices, anticipate further results which far exceed the limit of what has been accomplished in the past. Successful operative treatment of valvular stenoses of the mitral and aortic valves seems by no means beyond the realm of the attainable." In conclusion, he adds a few words on the resection of the esophagus. Only the lowermost segment of the esophagus, about six or eight cm. above the cardiac orifice and the cardiac orifice itself, may still be regarded as legitimate fields for the operation. Unless the lifting of the stomach through the diaphragm permits the replacement of the lower end of the esophagus, we are not justified in speaking of it as a useful operation. The article is accompanied by illustrations showing portions of the technic for some of the different operations and the instruments employed.

APPENDICITIS.

L. G. Guerry, Columbus, S. C. (*Journal A. M. A.*, January 1), reports his experiences with a consecutive series of 545 cases of appendicitis operations with only two deaths, these occurring in the first 100 patients operated on. This experience proves, in his opinion, that there is a factor in the surgical mortality that is not fully appreciated or provided against. In this total of 545 there were 240 chronic cases calling for an interval operation, with no deaths, as might have been expected. Of acute cases, 92 patients were operated on within thirty-six hours. His rule so far as he has one, is, he says, to operate as soon as the diagnosis is made, provided it can be made within thirty-six hours. After that the pathologic conditions are different; the third and fourth day cases are the ones that furnish the mortality statistics. Guerry holds that there is a definite tendency to localization in cases of appendicitis complicated with suppuration; there were 213 cases of this kind in the series; 68 of these were first seen on the third or fourth day of the disease. The pulse in most cases was 135, temperature 104 F., vomiting, distention, pinched features and some delirium were also present. None of these patients was operated on at once, but all were treated according to the Ochsner method, which he thinks is life-saving, at least in the practice of the ordinary surgeon and practitioner. Guerry emphasizes the fact that none of these patients was operated on immediately and none died. It must, he says, have been genuine insight in Ochsner to recognize that the chief factor in dissemination of the peritoneal infection is the vermicular movement of the small intestine and that physiologic rest is the rational treatment of the diseased process, thus enabling nature the chance she seeks to localize the disease. Gastric lavage, also, is rational, as it carries off the regurgitated contents of the small intestine and favors the attainment of physiologic rest of both organs. Guerry does not wish to be considered extreme, but he desires to emphasize the importance of utilizing and aiding the natural forces, and of using surgical discrimination and judgment in these cases. In almost all cases, he operated through the McBurney incision; when drainage is needed he drains through a stab wound to one side. The rule is to remove the appendix, but there are exceptions to this rule. He believes it better to enter the peritoneal cavity by Ware's modification of McBurney's method, pack off the

infected area and remove the diseased tissue. One of his patents who died had renal tuberculosis and succumbed on the eighth day with postoperative anuria. The other fatal case was that of a child who had been ill ten days and died of a continuation of the peritonitis.

TRANSPERITONEAL CYSTOTOMY.

E. S. Judd, Rochester, Minn. (*Journal A. M. A.*, December 25), speaks of the danger of delaying diagnosis of growths in the bladder and the consequent necessity of early operation before they become inoperable, and describes his method of treatment. One of the greatest difficulties in handling a tumor at the base of the bladder, where 90 per cent of these growths begin, is the inability to get a good exposure through a suprapubic or perineal incision. The hospital staff at Rochester therefore determined to try to improve on former discouraging results by incising the bladder so as to get a good exposure of any part and doing a more radical operation. They determined to open the peritoneal cavity deliberately and pair off the intestines and omentum, preparing this area of the peritoneal cavity for resection in the bladder similar to that for resection of any organ. The patient is placed in the high Trendelenburg position, and on opening the abdomen an opportunity is afforded for exploring the liver, pelvic peritoneum and lymphatics. While they have never seen an extensive involvement of the lymphatics, in one case a metastasis in the liver had already occurred and in another the condition was found on examination to make vesical operation useless. The operation is described as follows: "The intestines and omentum are packed into the upper abdomen with several large gauze pads, the packing covering the abdominal wound. The posterior bladder wall is grasped with tenaculum forceps, one on either side of the median line, and the bladder is lifted into the abdominal incision. A longitudinal incision is made in the posterior wall of the bladder, beginning on its peritoneal surface in the midline and extending well back to the base of the bladder. The urine is sponged from the bladder as soon as it is opened. This should be done carefully so as not to start a troublesome oozing. If the tumor is on a pedicle, this may be grasped by a pair of curved hemostats and excised with a cautery, leaving the cauterized surface to granulate. The area removed should include a portion of the healthy mucosa and submucosa. When the tumor has an indurated base it will be necessary to excise a portion of all the coats. At times as much as one-half of the bladder must be removed. It is essential to preserve as much as possible of the healthy tissue about the urethral orifice. If the bladder is involved at the ureteral opening, after the diseased portion of the viscera is removed, the ureter is divided near the bladder and drawn into the abdomen through a perforation in the peritoneum close to the remaining half of the bladder, into which it is passed and attached with catgut sutures. The peritoneum is closed over the exposed ureter in a fold, to insure rapid healing. The remaining part of the bladder is closed, and though greatly reduced in size, will be serviceable, and as time passes its capacity will tend to increase. Having completed the intravesical part of the operation, the same technic is employed in closing the wound in the bladder as that which would be used in repairing a wound in the intestines or stomach. The first row of sutures begins and ends with the knots inside. These are of chronic catgut placed as a running mattress or Connell stitch, including all the coats. The mucous edges are turned in not only making an air-tight and water-tight closure, but also controlling all bleeding from the edges. This suture line is re-enforced by a linen stitch, including the peritoneum, put in parallel to the previous suture line." Judd says that it is not necessary to drain the peritoneum or the bladder unless the growth involves the ureteral opening or the prostate is removed, when it is best to establish an independent drainage through the space of Retzius after the bladder has been closed. The Rochester surgeons have operated in this way in fifteen cases of tumors of the bladder with

one death. In this case the patient died of uremia at the end of the first week. There was found an acute nephritis of the right kidney, the other having been disabled by an old hydronephrosis which had almost completely destroyed it sparenchyma. Another patient died in three months of a recurrence in the peritoneum. The history of a number of these patients since operation is given. In nine of them the pathologists reported malignant papilloma and three were of the straight carcinoma type. While not advising the transperitoneal operation in case of tumors involving the upper quadrants of the bladder, Judd and his colleagues think that it is little, if any, more risky than any other operation in the greater number of cases which begin in or near the base.

HOSPITAL ANESTHESIA.

R. L. Dickenson, Brooklyn (*Journal A. M. A.*, December 11), classifies hospitals: First, into the large institutions where a salaried corps of anesthetists is possible and should be required. Second, the small group of private hospitals which can hardly do better than follow the plan of Baldy and the Mayos, who train an intelligent woman to do that one thing well. Such salaried service is reliable and unvarying and the work is dignified and cleanly. We may assume that physicians who find themselves in some ways unsuited for general practice would be glad to obtain an income from such a source. The third group is by far the largest. The country is covered with hospitals of medium size where ether is administeerd in a most haphazard fashion. He asks if we can maintain high standards of ether administration without too great an expense. It has been done, he says, by offering adequate inducements to men who were qualified or willing to qualify. These may be (1) the title of "anesthetist to the hospital"; (2) membership on the visiting staff or assistant visiting staff; (3) privileges, such as the use of the operating room for his own cases or the use of a free bed or beds in the hospital; (4) fees for administering anesthetics to private patients when the operation fee warrants it. (5) the understanding that the surgeons who do operations in private houses contribute to the anesthetist's income. An ex-interne who has shown natural aptitude for the work or one of the attaches of the surgical staff who will undertake to give a reasonable time to the work, may be elected and allowed to appoint one or more assistants or associates, according to the needs of the institution. In this way responsibility will be fixed. The office should not be a temporary one; the incumbent should engage to fulfill the duties for a fixed period, such as two or three years. A reputation may be gained by him in this line and his capabilities should be watched by the staff. Dickenson considers that the hospitals owe this to the public: First to furnish the patient the best possible anesthesia. Second to supply to the public as many members of the profession as may be needed who will have a fair working knowledge of anesthesia. Third to train for the profession, for its own hospital and other hospitals, a few expert anesthetists. He answers the objections that are usually made, and says that while it is drudgery in a measure, it is necessary and must be paid for or the present malpractice will continue.

ANIMAL EXPERIMENTATION.

The ethics of animal experimentation are discussed (*Journal A. M. A.*, January 15), by Prof. J. R. Angell, of the University of Chicago. He recognizes historically two divergent views, one that man is the overlord of the animals and may use them as he pleases for his pleasure and profit; the other that no man has a right to take animal life or cause animal suffering. The first of these views is hedged about with humanitarian restrictions in civilized countries. Buddhism is the great religious embodiment of the second view, but it has seldom been consistently followed. He finds no direct or unambiguous guidance in any of the theories of morals. Religious teaching is equivocal and certainly authorizes

the taking of animal life. The great mass of modern critics of animal experiments does not base its arguments on any special religious belief, but claims to support it on the general principles of humanity; that the causation of needless pain is a crime; that it is not justified by any useful results and is brutalizing in its effects on the actors themselves and the public. It is to be granted that if it is ever justified by its results, however, the basal ethical issue is closed. It only remains to insure this fact and to see that the minimum of pain is caused to the creatures used, and that the indirect effects on the public or students are not brutalizing and injurious. We have no calculus by which we may estimate the amount of pain to an animal or the amount of suffering saved to other creatures by its sacrifice. There is ample evidence, however, of the benefits obtained if we only take the prevention of smallpox and diphtheria, to mention only two out of a constantly lengthening list. It would be ridiculous to claim that all experiments on animals have as striking justification as this, however; but, as said above, these are enough to close the fundamental ethical issue. The problem which remains is simply that of determining the circumstances and conditions which warrant particular forms and cases of the method. The question that most concerns medical men here is as to what precautions should be thrown around animal experimentation and who shall control it and see that these precautions are followed. It is evident that there is a chance here for officious and unintelligent interference that may seriously cripple research. Personal opinions vary largely according to idiosycracy. If one is going to inquire seriously into the ethics of our human relations to animal forms, the same principles that would forbid animal experimentation would also apply to the killing of a mosquito because it is a nuisance, and the trend of modern opinion is certainly toward the right of society to protect itself from disease as well as crime. The public is coming to a juster appreciation, also, of the relation of science to social welfare. Science is simply the intellectual aspect of social progress, and when this conception is more familiar to us all we shall hear less of the "merely scientific interest in animal experimentation, as though there were any genuinely scientific interest which could escape contribution to social advance." Biologic science as well as pure medicine ought, therefore, to be free to pursue its researches in the general interests of mankind by such methods as are found necessary. To obstruct it by a general prohibition of experiments on animals is to sin against the light and turn back the hands of progress. The question as to the moral effects of animal experimentation on the persons who undertake it or observe it offers some difficulties. There is no need of denying that brutalizing effect may be thus produced, but in every reputable laboratory the practice is conducted as humanely as possible. Anesthesia is the universal rule and it is certain, Angell says, that the total amount of suffering the animals undergo is far less than they endure in the ordinary course of their natural lives. A loss of original squeamishness does not imply a loss of tenderheartedness, and in the larger view that looks to the welfare of mankind the experimentors are among the most valuable humanitarian members of society. He sees no reason to condemn animal experimentation in our intuitive moral convictions or traditional morality. To some sentimentalists it will never be justifiable, but to the public taking a calm and discriminating judgment, in the long run it should be recognized as valuable and necessary.

TUBERCULOSIS.

J. Girdwood, Baltimore (*Journal A. M. A.*, December 4), states that the responsibility of the family physician in case of tuberculosis has not been sufficiently emphasized. As he is first to be consulted he is responsible for the early diagnosis, and special attention should be given by him to the first symptoms of cough, afternoon fever, and loss of weight, and thorough physical examination cannot be too strongly insisted on. The examination of

sputum is also another necessary measure in all cases though it may not always reveal bacilli. A positive result is proof of the disease but a negative one does not always exclude it. There is no reason nowadays why the family physician should neglect tuberculin diagnosis and another important measure which should be more generally employed, is the examination of those who have been exposed to the disease. That the physician should tell the patient the truth in regard to his case is also insisted upon by Girdwood, and he thinks the time is not far distant when the doctor will be held legally responsible when he neglects the proper means for diagnosis or hides the truth afterwards. Some have even denied to the patient the existence of tuberculosis when the latter had been informed by other more conscientious physicians, with the result of the discontinuance of all prophylactic measures and the encouraging of a false hope in the individual. Such a case has recently come under Girdwood's observation and it cannot be too strongly condemned. Many physicians, he says, fail in their obligations to society. The public should be protected from the danger of the consumptive and Girdwood goes so far as to say that partial or complete isolation of the consumptive must become the most effective method of conquering the disease. We must discourage marriage or nursing of infants and must protect the laundress and housecleaner and the family whose servant has tuberculosis. All these come within the obligations of the physician. His responsibility to the state is also too much lost sight of by the physician. The advantages of registration are no longer disputed and yet physicians neglect to report their cases and Girdwood thinks that he is conservative in saying that 90 per cent of cases when reported are in the second or third stage, and not more than 10 per cent of early cases are reported. There are several reasons why these conditions exist. First, incompetency of the physician. Second, inexcusable carelessness. The third reason. economic considerations, is more difficult to combat. It is not always profitable for the physician to tell the patient the diagnosis or report him as consumptive, but this must be done if the physician does his duty.

BLOOD SMEARS.

E. R. Hayhurst, Chicago (*Journal A. M. A.*, December 4), describes a method of making blood smears preparatory to staining them which he thinks should be included in every text-book. He says that a correctly made smear is of as much importance as the stain. The object is to make them uniform and not to crush or distort corpuscles or other elements but have them evenly distributed over the surface. Use a good quality of glass slides cleansed by breathing on them and wiping with a clean old linen handkerchief, than which rarely anything more is needed. Cleansing the ear lobe with alcohol or anything else is seldom necessary. The lobe of the ear is rarely dirty enough to contaminate the blood as it is taken off. The needle should be well cleansed to avoid carrying infection on it from other uses. "Have two clean slides, A and B, ready. Stick the ear lobe with a Hagedon or similar cutting needle. No blood appears, as a rule, until gentle pressure is applied to the lobe. Touch center of slide A to the rounded drop of blood which exudes. Do not press the slide against the surface skin. Now grasp the right end of slide A, with blood drop on top, between thumb and fingers of the left hand (palm of hand upward), and hold slide horizontally with its left end directed obliquely away from the body and projecting two-thirds its length over the radical border of the hand. Take slide B in the right had, apply one end to farther edge of drop and pull B back toward you about one-eighth of an inch. This is to make the drop spread by contact sidewise in the acute angle formed between the slides. Next, holding slide B in place, pull slide A steadily backward beneath it and toward your right until the slides slip past one another. The blood-cells adhere to the moving horizontal surface of slide A and fall off from the

posterior surface of slide B in a smooth even sheet, uncrushed—in fact, untouched. Dry at once by shaking vigorously in the air. Thus one smear is made on slide A. Slide B may be smeared in exactly the same manner, using the end of slide A for contact. Stain as soon as convenient. Watch that flies do not walk over the surface of the dried smear or the corpuscles will disappear like magic." He also gives a lengthy description of the staining method and of the factors which make for its success or failure. His summary is as follows: "1. The Harlow stain for blood-smears is utilized in a one-minute method so that it 'stains everything' with perfect satisfaction. 2. The method is simple, convenient, and dependable. 3. The physician prepares his own stains to start with. 4. The stain solutions are always ready and keep indefinitely. 5. The stain and method of staining are recommended for dried smears of all kinds. 6. Satisfactory blood-smears may be made by following specific directions. 7. Peebles's and Harlow's observations on corrections of faulty eosin-methylene blue stains render control practically absolute."

AMMONIA DETERMINATION.

E. W. Brown, Assistant Surgeon U. S. N., attached to the battleship "Vermont," describes in the *Journal A. M. A.*, December 18, a modified technic of the formalin method of the ammonia estimation in urine, which he claims will be available for the general practitioner with limited laboratory resources. The importance of this estimation in condition in acidosis of diabetes, pregnancy, etc., is evident since the ammonia determination affords an index also of the quantity of acetone excreted, and of the total amount produced and shows the degree of acidosis. The normal daily ammonia output may be given as about 0.7 gm. This may increase to 8 or even 12 gms. in diabetic patients in whom from 4 to 5 gms. is common. Brown gives the principles of the formalin method and its modifications by Malfatti, Folin, and others, and says that he, several months ago experimented with them on various urinary samples. It occurred to him that clearing the urine with subacetate of lead might be of advantage in removing interfering coloring matter before titration. The results were striking: the second point of the titration was brought out much more sharply, and the accuracy of the method was improved 15 per cent. "The technic of the modified method is as follows: About 60 c. c. of filtered urine are treated with 3 gm. of basic lead acetate, well stirred, allowed to stand a few minutes and filtered. The filtrate is treated with 2 gm. of neutral potassium oxalate, again well stirred and filtered. 10 c. c. of the clear filtrates are diluted to about 50 c. c. with distilled water and a few drops of 1 per cent phenolphthalein added. The fluid will be slightly alkaline or acid; more frequently the latter. 15 gm. of neutral postassium oxalate are added, thoroughly stirred, and the specimen exactly neutralized with 1-10 normal sodium hydroxid or sulphuric acid; 20 c. c. of 20 per cent commercial formalin, previously made neutral, are added and the solution is again titrated with 1-10 decinormal sodium hydroxid. Every cubic centimeter of 1-10 normal sodium hydroxid corresponds to 0.0017 gm. ammonia. The burette reading of the second titration multiplied by this factor represents the amount of ammonia in 10 c. c. of urine. The quantity is then calculated on the basis of the twenty-four-hour volume." He says that this technic should recommend itself by its simplicity; an estimation can be made in duplicate in ten minutes. The results by this modified method and without clearing by lead are compared with each other and with those by Shaffer's vacuum method in a table in the text.

PUBLISHERS' DEPARTMENT

An Important Utero-Ovarian Sedative, Anodyne and Tonic.

While it is unquestionably true that many cases of pelvic diseases in women are amenable only to surgical treatment, it is quite evident that there are not a few in which, for some reason or other, operative measures are out of the question. Among these may be included the many cases of dysmenorrhea and ovarian hyperesthesia, for the relief of which recourse is too frequently had by the patients to alcohol, the narcotics, or some of the much-vaunted nostrums on the market.

It has been shown to be a mistake to suppose that substantial and lasting benefit cannot be obtained in these ailments by the internal administration of therapeutic agents, a number of which have been thoroughly tried, with results often satisfactory, sometimes brilliant. An agent of undoubted value in such cases is Liquor Sedans, a preparation introduced to the medical profession many years ago by Messrs. Parke, Davis & Co., and esteemed and prescribed by physicians to an extent, it is believed, not equaled by any similar compound.

Liquor Sedans is composed of three of the most important sedatives, anodynes and tonics to the female reproductive tract—namely, black haw, hydrastis and Jamaica dogwood—so combined with aromatics as to constitute a very acceptable preparation, being in this respect unlike some other agents of a similar nature which are ordinarily taken with great reluctance. It is of marked usefulness in the treatment of functional dysmenorrhea, menorrhagia, ovarian irritability, menstrual irregularity, etc. Parke, Davis & Co. also manufacture Liquor Sedans Rx 2 (without sugar), which is precisely like the older formula but for the omission noted, and which is available for use in cases in which sugar is contraindicated; also Liquor Sedans with Cascara, which is of the same composition as Liquor Sedans except that each fluid ounce contains 40 minims of the fluid extract of cascara sagrada, giving to the formula an important tonic-laxative value.

Dr. Geo. E. Pettey of Memphis has admitted his former assistant, Dr. W. R. Wallace, as a full partner in his sanitarium, and they have built a forty-room addition to their sanitarium.

The new building has been constructed according to plans especially adapted to their work, rooms in suite or single, with private bath, hot and cold water, electric bell system, steam heat, with every modern convenience for the employment of hydro and electro therapy. Separate buildings for male and female patients.

While their work will be principally confined to the treatment of Alcohol and Drug Addiction they will hereafter also admit patients suffering from Mental and Nervous Diseases. A detached building will be used for the mental cases where special attention will be given to the treatment of acute insanity. Violently insane patients will be admitted for treatment during the acute stage.